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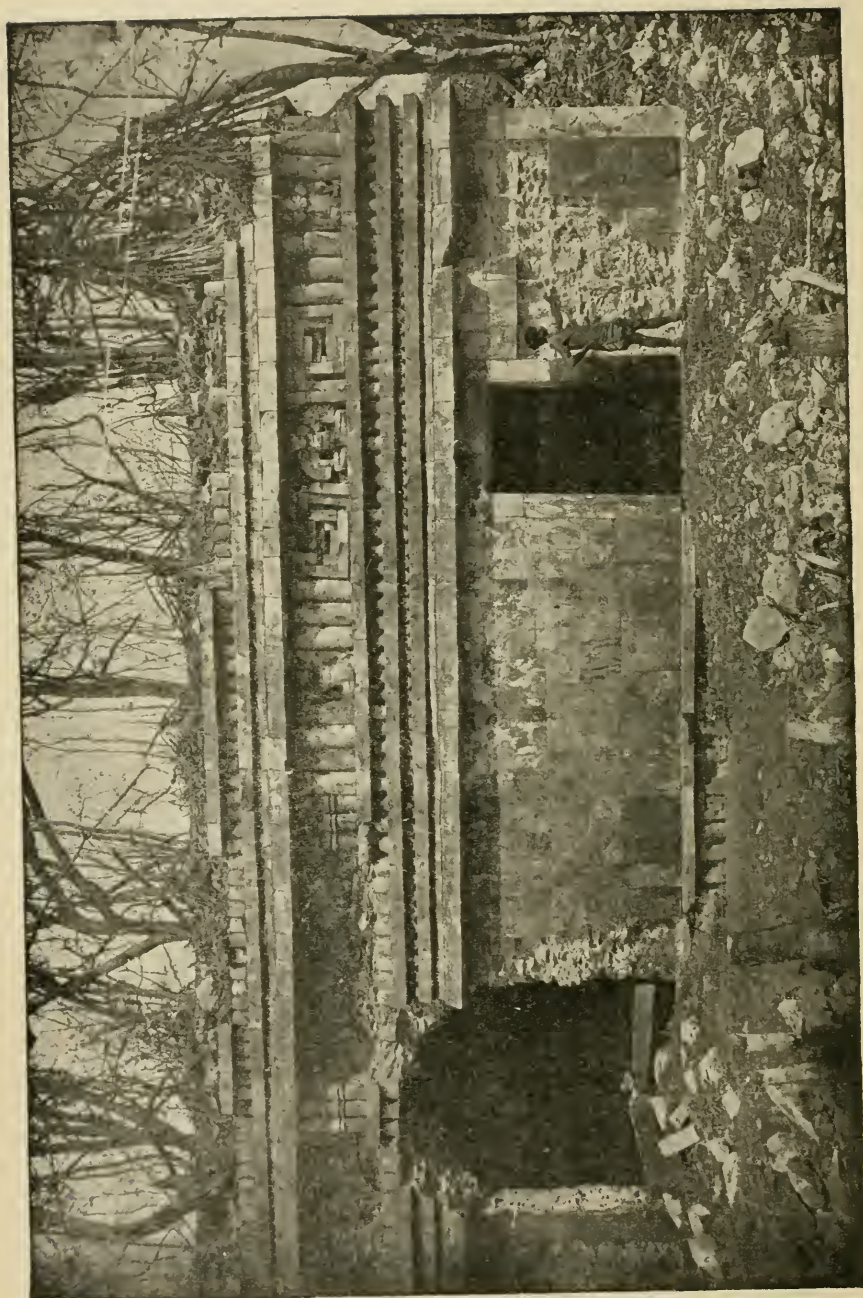
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COLUMNAR TEMPLE WITH GREEK FRETTS IN PIEDRAS NEGRAS.

ANCIENT MONUMENTS
AND
RUINED CITIES
OR
THE BEGINNINGS OF ARCHITECTURE

BY

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INTRODUCTION.

THE ruined cities which are spoken of in this book are situated in the two continents of Asia and America, and are separated from one another not only by the great seas, but by many centuries of time. for the cities of Babylonia are supposed to have been built 5,000 years before Christ, while those of Central America do not date earlier than 500 years after Christ.

The author, in treating of these cities, has shown that there were many rude monuments which preceded them, and that there was a growth from these, through successive stages which were parallel in all lands.

A chapter is given to the description of the earliest home of the human race, and it is shown, according to the evidence furnished by recent explorations, that this was in the valley of the Tigris, in the very locality where the Garden of Eden was located. This chapter is followed by another which illustrates the different stages through which architecture passed; stages which are shown in the character of the walls, as well as the buildings and decorations.

Chapters are given on the origin of the arch and the column; on pyramids and palaces in America; on houses and house life; on the architecture of the civilized races; on ancient temples and palaces; on the Toltec cities; buried cities of Honduras and the ruined cities of Peru.

A chapter is given on such common things as boats, roads, bridges, and ancient canals, which is designed to show that there was as much progress in these, as in the house architecture, or in that of palaces and temples. The object is to show the growth of architecture from its earliest beginnings in pre-historic times, up to the date of the opening of history, and that parallel stages can be recognized in all lands.

In the chapter on village life and village architecture it is shown that cities, even in pre-historic times, grew out of villages, but the village was generally made up of a number

of clan residences, and that there were no such separate habitations as in modern times. The chapter on the arch and column illustrates the laws of parallel development, but the chapter on the architecture of different districts shows the diversity of architectural styles which appeared in all lands.

That there was a correlation between the scenery and the architecture is shown by a number of facts. At the same time the effect of material upon architectural styles is also manifest. The religious element was, however, a very important factor in the growth of architecture; this is illustrated by the chapter on ancient temples, and other chapters on ruined cities.

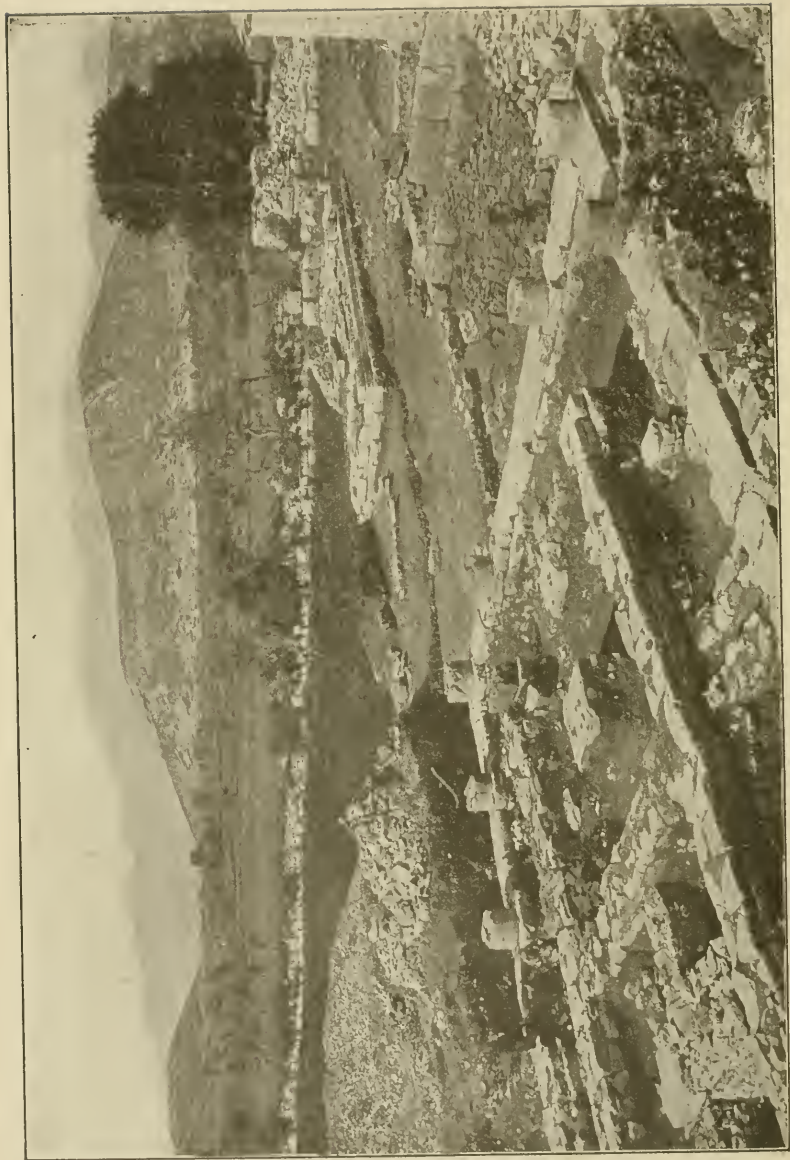
The illustrations are drawn from a great variety of sources, and exhibit the different forms of structure which were erected in all lands. It is not only in Asia that ruined cities are to be found, for they are scattered over the entire world, and they all present features which are very instructive, as to the natural and acquired skill of the different races of the earth in erecting habitations and inventing architectural ornaments. America is as instructive in this respect as any other land, and has this advantage; that it was so widely separated from other lands that the growth of architecture seems to have been entirely independent, and uninfluenced by the inventions of tribes and races which had emigrated, and brought with them the styles which had grown up elsewhere.

The plates and cuts which have been used in the book have been taken from a variety of sources; some of them from the old Spanish writers; others from more recent travellers; a few have been reproduced from photographs taken upon the spot. Some of these may seem familiar, but all are valuable in illustrating the points made.



RUINED TEMPLE AT STRATOS, GREECE.

Courtesy of Scribner Company.



RUINED TEMPLE AT THERMON, GREECE.

Courtesy of Scribner Company.

The Monuments of the Stone Age.

CHAPTER I.

AGE AND DISTRIBUTION OF THE MONUMENTS.

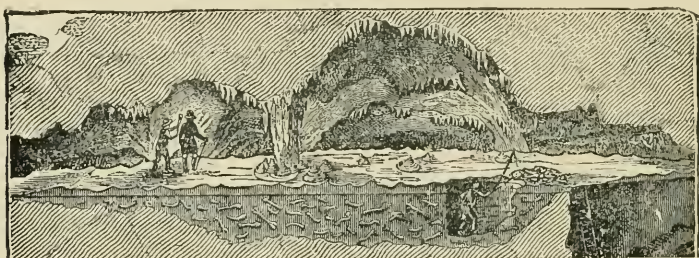
The knowledge of the Stone Age has generally been acquired by the study of the different implements and relics, the material of which they are composed giving the name. The distinction between the three ages has also been marked by the same means, as the abundance of stone relics gave the name to the Stone Age, the bronze relics gave their name to the Bronze Age, and the prevalence of iron, the name to the Iron Age. There are many advantages to this system which makes the material of the relics a sign of the age, and, for this reason, it has long been very popular, and useful. The advantages may be enumerated as follows; first, the relics may be gathered into the museums and classified according to the material, and by the means the stage of culture, which had been reached, is at once brought before the eye; second, the increase of skill in making tools, weapons, and implements, and the growth of art during the prehistoric period are plainly shown by the study of the relics of various kinds, especially if we include the various specimens of pottery and shell-work, and textile fabrics; third, another advantage is that a comparison may be made between those which are gathered from widely separated localities. It is by this means that the law of parallel development may be recognized, and the progress of the different nations during the prehistoric period may be clearly seen.

Now taking these advantages together, it is not at all strange that the study of the relics has been a favorite one, and that the science of archæology has so rapidly advanced. There are, however, as many advantages coming to us from the study of the monuments as from the study of the relics. They are as follows:

1. The view of primitive society which is gained from the study of the monuments, is much clearer and more comprehensive than from the study of the relics. It is true that the relics gathered in museums do show the various stages of pro-

gress through which man has passed, but the difficulties which have been overcome cannot be realized until we go to the field and study the environments.

2. Man's power in adapting himself to his circumstances is shown by this means. In this his superiority over all other creatures is proven. The animals, to be sure, do adapt themselves to their circumstances, but they are so affected by their surroundings that ultimately their own natures change; they, in fact, yield to nature, and they are modified by her. With man, the case is different; he, everywhere, proves himself a conqueror and shows himself to be superior to his surroundings. The law of survival of the fittest is illustrated in him far more than in any of the animals.



PALÆOLITHIC CAVE IN BAVARIA.

3. The progress of man in architecture as well as in art is shown by the monuments when seen in the field. There may, indeed, be a few specimens of architecture brought from afar and gathered into the museums, and the styles of ornamentation may be compared by this means, but the massiveness, the strength, and the stability of the works of man are never shown by these specimens. They are mere fragments and have no such settings as are shown where they are seen in their natural surroundings. Even the rudest specimens of man's handiwork prove at times to be very impressive, for the building or the monument, whether made of earth, or wood, or stone, shows his power of making the means serve the end, which no mere relic can show.

4. The chief advantage to be gathered from the study of the monuments, is that it enables us to recognize the different epochs which belong to the Stone Age. These epochs are not easily distinguished by the study of the relics, but the monuments differ so much in material, style, stages of progress, and degrees of finish that we may easily identify the epochs by them. The differences may be owing to the ethnic tastes, for the ethnic type is always impressed upon the structures, but the stages of progress are so marked that we may recognize them, even in the same region, and when we compare one locality with another, we may identify them with the epochs, and so mark subdivisions of the Stone Age.

5. The comparison of the monuments shows that nearly every people has passed through the same stages of progress before they reached the stage of civilization. We may regard the monuments as the alphabet of history, marking a period when the human race was in a state of tutelage, in fact, in that state in which a child is learning to read. The art of constructing a sentence with a child follows that of acquiring the alphabet. So the art of constructing a finished building and giving to it such architectural features as would make it either substantial and enduring, or attractive to the eye, must follow the beginnings, which are marked by these rude structures. There are many rudimentary forms which mark the progress of the prehistoric people, and are peculiar to the prehistoric age, some of them upon this continent, others upon the eastern continent, but all of them present characteristics which are worthy of especial study.

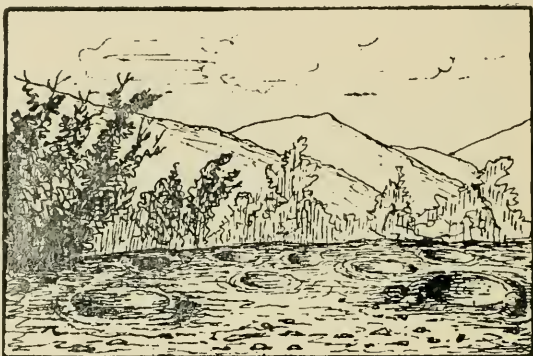
It will be the object of this volume, to describe the monuments of the Stone Age, but we shall devote the present chapter to a consideration of their distribution.

I. We will begin with the Kitchen Middens or Shell Heaps. These, in the strict sense of the word, are not monuments, and yet they are tokens which show the presence of man in various parts of the world, and many of them are so old as to make it appropriate to consider them. The Kitchen Middens on the coast of Denmark were brought to the notice of archaeologists at a very early date, and may be said to have laid the foundation of modern archaeology. These were found to contain the bones of animals, which are still found in the sea and forests of the region, but contained no bones of such extinct animals as have been found in the caves; nor do they even contain any bones carved with the figures of these animals. It is on this account that the Kitchen-Middens are important, for they form the connecting links between that age in which man was associated with extinct animals, and that age in which man began to domesticate the animals. They are in reality the monuments of primitive man, and of the animals with which he has been associated. It may be well to mention the animals which were associated with man when he was a troglodyte, or cave dweller. Sir John Lubbock has given a list of these. They are as follows: Cave bear (*Ursus spelæus*), cave hyena (*Hyæna spelæa*), cave lion (*Felis spelæa*), mammoth (*Elephas primigenius*), mastodon (*Elephas antiquus*), hairy rhinoceros (*Rhinoceros tichorinis*), hippopotamus (*Hippopotamus major*), musk-ox (*Ovibos moschatus*), Irish Elk (*Elanus fossilis*), glutton, aurochs (*Bison Europæus*), urus (*Bos primigenius*). The bones of some these animals are found in Siberia and in Arctic America, others in southern Africa; others in France and Germany, the British Isles, in Siberia, and scattered from Bering Straits to Texas, but none have been found

either in the tumuli of western Europe or America, or in the Danish shellmounds or in the Swiss lake villages.*

There is something fascinating in the thought that these animals were known to the ancient troglodytes of Europe, and that man at his early stages of existence, had to contend with such gigantic creatures. Lubbock says that during the earlier human period, England and France seem to have been inhabited by the gigantic Irish elk, two species of elephant, and three of rhinoceros, together with the reindeer, a large bear closely resembling the grizzly bear of the Rocky Mountains, a bison scarcely distinguishable from that of the American

Prairies, the musk-ox of Arctic America, the lemming of the Siberian Steppes, the lion of the tropics, the hyæna of the Cape, and a hippopotamus closely resembling that of the great African rivers. The animals which were found in the kitchen-



middens or shellmounds of Denmark are such as are peculiar to the forest and the sea. They are as follows:

The stag (*Cervus elephas*), the roedeer, the wild boar, the urus, the dog, the fox, the wolf, the marten, the otter, the porpoise, the seal, the water rat, the beaver, the wild cat, the bear, the hedgehog, the mouse, traces of a small species of ox, the aurochs (in the peat-bogs), the aquatic birds, such as swan, ducks, and geese. The urus and the domestic ox, sheep and the domestic hog are all absent. The flint implements resemble those which are characteristics of the "coast finds." They may be classed as shellmound axes, flint-flakes, bone and horn awls, pottery, stone hammers, sling stones, very few polished axes. The total absence of metal indicates that they had no weapons except those made of wood, horn, stone and bone.

The change from association with extinct animals, to that with the animals which still exist was attended with a great change on the part of man himself. Man is no longer a mere troglodyte or cave dweller, but he is a house builder and begins his career as an architect. His social condition changes greatly. He is no longer a mere shaggy creature who shares his abode with the animals, and has no desire for progress, but

* An exception must be made of the musk ox, the aurochs, the urus, and of the mammoth for all these have been found so close to the relics of the stone age as to make it probable that they survived to that age.

he is a home-maker, and has a family for which he provides. Society may, at an early stage, have been organized into clans, and the clans may have had all things in common, but, after all, the family was recognized, the hearth and home became, in a measure, sacred, and the house became a monument, not for the beast, but for humanity and all that the term implies.*

Prof. Worsaae says:

Shell mounds and coast finds are characterized by very rough flint implements, and are the remains of a much ruder and more barbarous people than that which constructed the large Stone Age tumuli, and made the beautiful weapons, etc., found in them.

The chief characteristic of the shell heaps is that so many of them contain circles which show the sites where the circular huts stood. They are formed by the accumulations or the refuse, which must evidently have occupied a considerable period to have reached the depth which has been found in the heaps. The inhabitants have been compared to the Fuegians, who, according to Darwin, lived chiefly upon shell-fish, and were obliged constantly to change their place of residence, but they returned at intervals to the same spots, as is evident from the pile of old shells, which must often amount to some tons in weight. These heaps can be distinguished at a long distance by the bright green color of certain plants that grow on them.

The wide distribution of the shell heaps has been dwelt upon by various authors, but the characteristics remain about the same. In Scandinavia, old hearths were brought to light, consisting of flat stones, on which were piles of cinders and fragments of wood and charcoal. In Germany, kitchen-middens contain bone implements, the bones of domestic animals and numerous skeletons upon the abandoned hearths. In Portugal, shell heaps have been found from thirty-five to forty miles from the sea coast, sixty-five to eighty feet above the sea level, containing several different hearths, also ancient kitchen middens in the valley of the Tigris in which were found crouching skeletons, proving that here the home had become the tomb. It is evident that in all these places, man had made his fixed abode, and that the tent or the temporary shelter of the nomad had given place to the hut, but that man had not reached the agricultural state, for no seeds or grain or agricultural tools have been found in them. In America, shell mounds are numerous, and their size and extent bear witness

*The changes which occurred in the fauna during the Stone Age may be learned from the fact that at the beginning there were no domestic animals, except the dog, but at the close nearly all the domestic animals were present and common. The greatest changes occurred during the time of the lake dwellers. The aurochs, the urus, the stag, the bear, and the wild boar were known to the early lake dwellers, for their bones have been found at Welhausen and elsewhere. The urus or *Bos primigenius* was tamed, crossed with other earlier types by the lake dwellers, and gave a variety of breeds during the Stone Age. The lake dwellers also had other domestic animals, one species of dog, a small ox, the horned sheep, the goat and the horse, though the domestic horse was not introduced till the Bronze Age. It was small and slender, with small hoofs, and resembled the Greek horse. It was not inferior to the wild horse which was hunted and eaten by the cavemen of paleolithic times. The number of animals slain by the lake dwellers is shown by the fact that five tons of bones were found at Robenhausen. There were very few domestic animals during the time of the kitchen middens, though the domestic dog was common. The majority of the bones are those of fish and of the wild animals.

to the number of inhabitants that dwelt near them and the long duration of their sojourn. They all bear a close resemblance to those of Europe. They show that the early inhabitants fed almost entirely on fish, their weapons, tools and pottery were almost identical in character, the use of metals was uncommon, and animals were of the same general character.

There is this difference, however, that shell heaps in America were occupied until a late date; those on the northwest coast are still occupied. Those in Florida present every evidence of having been occupied by a people who were accustomed to navigate the sea, and who erected their villages on the islands and keys which surround the coast, and have left many interesting tokens of their skill in defending their homes from the incursions of the waves as well as making the extensive bayous and lagoons into which the schools of fish were driven. The houses which stood among the shell heaps, and on these walls which surrounded the lagoons, have disappeared; yet the character of the wooden relics which have been discovered, shows very considerable advance in imitative art as well as skill in constructing canoes, and other articles necessary to a sea-faring people. See plates.

II. The Lake dwellings and Crannogs which are so numerous in Europe form a class of monuments which is very suggestive of the condition of architecture during the Stone Age. These are not so ancient as the kitchen middens, but they belong to the prehistoric period and some of them to a very early part of it. They are very numerous in Switzerland, and are of two kinds, those that belong to the early Stone Age and those which belong to the Bronze Age, the difference between them consisting in the fact that the latter were generally built farther out in the water, and the piles which supported them were more numerous, the platforms were longer and wider, and the houses upon them were better built. The Lake-dwellers resembled the people who built the kitchen middens in that they loved the water, and drew their subsistence from it largely, and had many boats in which they navigated the lakes, but they differed from them in that they cultivated the land and raised grain and many kinds of fruit. "The discovery of these piles excited general interest, an interest which was redoubled when similar discoveries revealed that all the lakes of Switzerland were dotted with stations that had been built long centuries before in the midst of the waters. Twenty such stations were made out on Lake Bienne, twenty-four on the Lake of Geneva, thirty on Lake Constance, forty-nine on that of Neuchâtel, and others, though not so many, on Lakes Sem-pach, Morat, Moosedorf, and Pfeffikon. In fact, more than two hundred lake stations are now known in Switzerland; and how many more may have completely disappeared?

There is really nothing to surprise us in the fact of build-

ings over the water, as it is the safest place, especially for people who dwell in the midst of forests where wild animals are numerous, and where unseen foes may be constantly lurking.

The peculiarity of pile-dwellings is that they are made of wood, and yet many of them belong to the Stone Age. It is remarkable that wooden structures which were erected during this age should have been preserved so perfectly that archæologist have been able to reconstruct them, and to decide as to their shape, the manner in which they were built, their distance from shore, and the class of people who occupied them. This is owing largely to the fact that the pile-dwellings of Switzerland were buried under deep layers of mud, and so were kept from the destroying influence of the elements. It is well known that wood, when buried under soil and away from atmosphere, may remain for many ages and its fiber and character may be easily determined by the geologists and naturalists.

Along with the wooden piles, many remains of fruit, grain, and woven garments, as well as stone and copper relics, were discovered in the mud in a fair degree of preservation. These have furnished a view of the domestic life and social condition of the people who dwelt in the interior of the continent of Europe in prehistoric times, and have thrown much light upon their mechanical skill and their art and architecture.

The mounds, cists and stone chambers when opened contain the remains of bodies and relics which had been used, but the remains of the Lake Dwellings have furnished a view of the people as they were when alive, and it is easy to draw a picture of their social condition and to imagine their mode of life.

The Lake Dwellings of Switzerland may be assigned to three different periods. The first is marked by rude stone relics, coarse pottery and no ornamentation; the second, by hatchets, made of nephrite or jade, and a few copper relics; the pottery is finely ornamented, and has projecting handles. The third was marked by copper weapons and tools, stone hammers and hatchets carefully pierced, beads, necklaces, pendants, buttons, needles and horn combs, vases provided with handles and covered with ornaments. The distance from the shore of the ancient Lake Dwellings varied from 131 to 198 feet, the more recent, from 656 to 984 feet. Some of the pile dwellings were held by piles driven into the mud, others by piles which were kept in position by blocks of stone, called *pack-verbauten*, and by the Germans, *steinbergen*. The number of piles is very great, varying from 40,000 at Wangen to 100,000 at Robenhausen. The area occupied by the station varies from 1,200 to 21,000 square feet. The houses on the platforms were made of wattle and hurdlework, and sometimes of piles split in half, and the floors were of the same material and divided by thick layers of clay. These houses are the earli-

est specimens of house architecture that have been found in Europe.

It has, however, been shown by recent discoveries that a similar mode of life prevailed in many parts of the globe in prehistoric times, and survived into the historic days.

The point which interests us at the present time, is the distribution of the pile-dwellings. They were known in early historic times as situated in the midst of the forests of Europe, and as marking the different stages of growth through which society passed in that region. Latterly, however, it has been noticed that similar structures still occupied, are scattered along the shores of the different continents and near the islands of the Pacific, though few have yet been found on the western coasts of America.

This custom of erecting houses above the water was not confined to Europe or Asia, or the prehistoric age, for there are many islands scattered over the South Pacific, near which houses are still to be seen built above the water, specimens of which may be seen in the cuts. This custom became so common, that many of the houses on the islands themselves were built on high posts. This custom prevails at the present time in the Philippines, in Borneo, and elsewhere. The reason for it is that it protects from floods and from reptiles. It is probable that it came originally from the Malay habit of erecting buildings over the water. In the olden time it was the custom when the first post



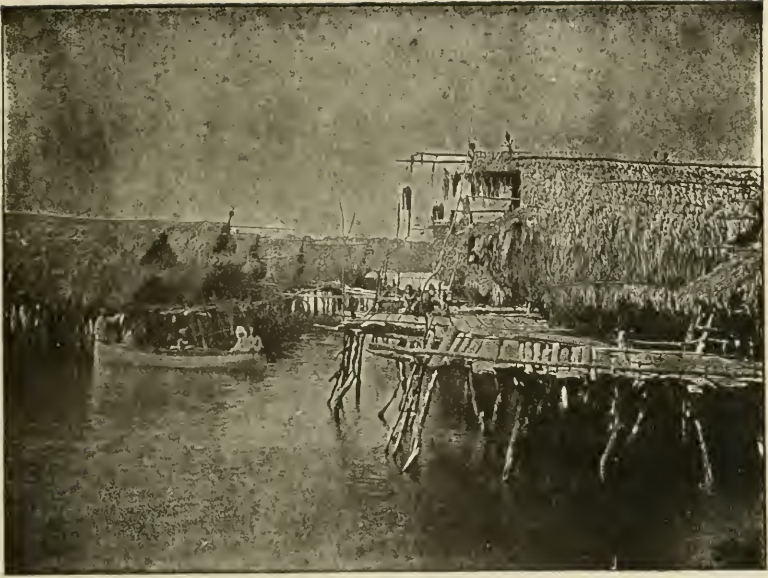
BOAT WITH OUT-RIGGER.

was set in the ground to sacrifice a slave and place the body below the post, a custom which seems to have spread as far as to the Northwest coast of America.

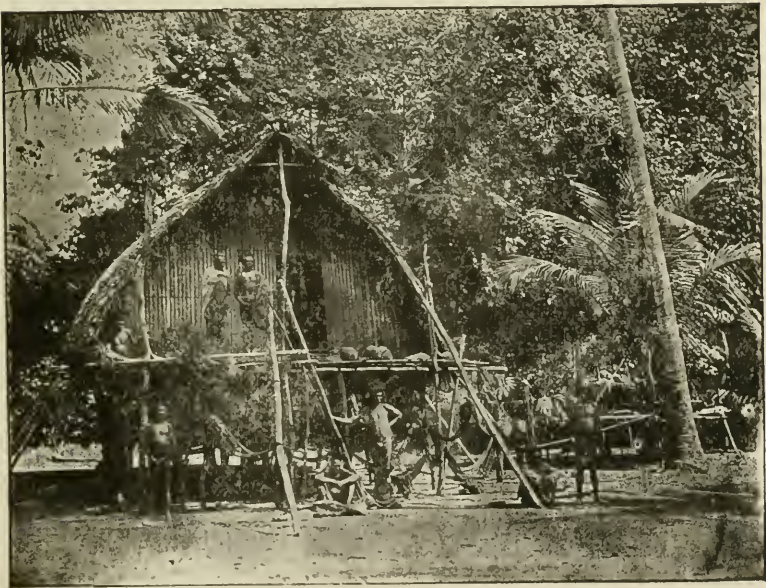
The different cuts illustrate the manner of constructing houses upon land, with posts below designed to support them, the platforms and floors being raised above the surface of the earth, very much as the platforms were placed above the surface of the water. Such dwellings, however, are found in tropical regions where vegetation grows rank, and where venomous reptiles are numerous.

In these tropical regions the natives are very fond of the water and always feel safe, even when propelling their frail vessels far away from the land. They have invented outriggers and other contrivances to keep their boats from upsetting.

The crannogs of Scotland and Ireland have sometimes been classed with the Lake Dwellings, though they are really artificial islands, which are connected with the land by



PILE-DWELLINGS NEAR BORNEO.



HOUSES OF THE DYAKS BUILT ON HIGH POSTS.



RUDE HUTS OF THE CALIFORNIA INDIANS.



HOMES OF MARITIME PEOPLE.

regular paved way formed of pebbles which were interlaced with branches, led up to a hearth made of flat stones measuring some three feet every way. With this house a quartz wedge and a stone chisel showing signs of service were found. Another hut, with an oak floor rested on four posts beneath a deposit of peat, twenty feet thick.*

A modified form of Lake dwellings has been found off the coast of Florida. These have been referred to under the head of shell mounds, but we describe them under the head of Lake dwellings. They are really island villages or marine structures. One such village was found on the Florida keys and described by Mr. F. H. Cushing. It consisted of a series of earthwalls built around the edge of the island, which walls were protected by an immense number of conch shells. Within the wall are a number of lagoons. In the midst of the lagoons are platform mounds, arranged in terraces with graded ways built on the sides in such a manner that people might pass from their houses to their boats without being disturbed by the waves of the sea.

Mr. Cushing says:

Here, at least, had been a water court, round the margins of which houses rather than landings had clustered, a veritable haven of ancient pile dwellings, safe alike from tidal wave and hurricane, within these gigantic ramparts of shell, where through the channel gateways to the sea, canoes might readily come and go.

In places off to the side on either bank were still more of the platforms rising terrace-like but very irregularly, from the enclosures below to the foundations of great level-topped mounds, which like worn-out, elongated and truncated pyramids loftily and imposingly crown the whole—some of them to a height of nearly thirty feet above the encircling sea. The ascents to the mounds are like the ridges below, built up wholly of shells—great conch shells chiefly—blackened by exposure for ages.†

III. The Chambered tombs form an interesting class of monuments. These are very numerous in Europe, but they are found in various parts of the world. The peculiarity of these tombs is that they were erected for burial purposes, but generally had an open chamber constructed of stone which was connected with the outside of the mound by a narrow passage, which was left open and would admit of the passage of bodies into the chamber after the tumulus was erected. The majority of these tumuli have been referred to the Stone Age, though

* Some of the Lake dwellings were constructed on masses of wood consisting of five or six platforms with brush and tree-tops, called Fascines. They were really a lattice of trees and brush. The floor consisted of layers, of fagots and sticks laid parallel to each other, the spaces filled with clay and rushes. As in all the Lake dwellings, the space between the posts, three or four feet wide, was filled with wattlework and then coated with clay. The roof was formed of layers of straw and rush. The dwellings were rectangular, and were on the average, twelve feet broad, and twenty feet long. Each cottage had its own special appliances, a hearth, a millstone, sharpening stones, a loom for weaving textile fabrics. Apple cores and cloth were found at Wangen. The huts which were erected by the southern Mound-builders resemble the Lake dwellings in many particulars.

† For further description see my work on the "Beginnings of Architecture," p. 102.

some of them belong to the Bronze Age. The feature which distinguishes the two is that the bodies which were buried in the Stone Age, were accompanied with weapons, implements, and ornaments of stone, bone and amber; those of the Bronze Age, * "with a variety of splendid weapons, implements, and jewels of bronze, and sometimes even jewels of gold."

The tumuli of the Stone Age were frequently surrounded by circles of stone which enclosed them very much as a fence with a modern grave, making them sacred. These circles are very common throughout Great Britain and are sometimes mistaken for the larger circles which were designed for assembly places and for religious ceremonies.

Joseph Anderson says:

The circle of erect stones which marks off the grave ground from the surrounding area, are memorials of moral significance, whether they be regarded as the marks of filial piety and family affection, or of more public sympathy and appreciation of worth. They are stone settings and are connected with sepulchres or graves just as were the groups and rows of standing stones. The variations in the form or arrangement of stone settings are not accompanied by corresponding variations in the burial customs. The overground features were variable, but the underground phenomena were persistent. In all the instances, the circle of stone settings, whatever may be the precise form which it assumes, has been found to be the external sign by which the burial ground is distinguished from the surrounding area. Like the cairn, it is the visible mark of the spot of earth to which the remains of the dead have been consigned.†

An interesting thought connected with all these chambered tombs is that they resemble the huts which are still occupied by the Esquimaux, and are supposed to have originated with a people who were not unlike the Esquimaux in their habits of living and modes of constructing their houses. Confirmation of this is the fact that the chambered tombs are found in the north Europe, where the climate is cold and where the houses of the living are still placed partly beneath the soil, and in some cases, are covered with sod, and have a passage-way similar to those of the tombs. This habit of making the home of the dead imitative of the home of the living, is very common. It extends so far that the bodies are placed in a sitting posture against the sides of the chamber. Vessels containing food are placed beside them, along with weapons and ornaments which were used during life, and sometimes the symbols of their religion are inscribed upon the sides of the tomb. It was a custom with these northern people, to build their houses in circular shape, and place the sleeping apartments on the outer edge of the circle, the open space in the centre being left for the families together, the fire always being placed in the center, with the smoke escaping through the roof. The rooms were naturally dark, but the door was always placed on the southeast side. The explanation of this is as follows: In northern regions the light would dwindle early

* Worsæ's *Primeval Antiquities*, p. 93.

† See "Scotland in Pagan Times," p. 97. Joseph Anderson.

in the afternoon and tarry late in the morning. It was important then that the door should be in the direction of the sun so that the light should shine into the room; if it did not awaken the inmates, it would shorten their night and make it easier for them to begin their work earlier in the day. It is an important fact that the chambered tombs were made in imitation of these primitive houses, the bodies being placed in circles, the passage way being to the southeast.



CHAMBERED CAIRN.

Chambered tombs are, however, scattered over the globe, in Russia, in America, in China, and Japan, as well as the various parts of Europe. Different names are given to these tombs: In Russia, they are called *kurgans*; in Japan, pit dwellings; in America, simple mounds, without distinguishing them from other tumuli or burial mounds. Most of these are derived from the habit, which is common in the northern countries, of placing the house below the surface and building the walls and roof of timber, covering the whole with layers of earth, as the manner of placing the dead in the chambers of the tombs plainly shows.

Subterranean dwellings made of rough stones laid down in regular courses with the walls converging toward the center, covered with earth are common in Ireland. They are called Picts' houses. These sometimes contain several rooms. They furnish a very early type of the stone house; they differ from all the other structures, in that they are made of stone.

IV. Chambered cairns are to be considered in connection with the chambered mounds or tumuli. These belong to the Stone Age, whether found in Europe, or America, or elsewhere. Joseph Anderson has described those of Scotland. Some of these cairns are in the shape of boats, others in the form of animals with horn-like projections at either end; still others are in the shape which resembles the banner stones or maces which are common in America and are symbolical in their character; others are mere hemispherical heaps of stone, containing chambers within them, but always with a passage way from the surface to the chamber. They are distinguished from all varieties of sepulchral constructions by this charact-



BEE-HIVE HUT.

eristic; the compartments within the cairn have a bee-hive roof, making them resemble the so-called bee-hive huts.

These cairns are peculiar to Scotland, though chambered mounds which contain an internal construction of stones laid up in regular shape, resembling a house with a flat roof, are common in Denmark and Sweden. There is a cairn near the great stone circle of Stennis, on the Orkneys, which contains a central chamber about fifteen feet square, to which access is provided by a passage fifty-four feet in length. The stones of which the chamber is built, are undressed slabs and blocks of a hard close-grained stone common in the region, the natural shape of the stone enabling the builders to fit them



CHAMBERED CAIRN AT MÆSHOWE.

close together, and to build walls of as nearly smooth and vertical surfaces as if they had been hewn. The walls of the chamber are covered with Runic inscriptions which would seem to identify them with the historic age, but Mr. Anderson maintains that "all the chambered cairns of the northwestern area of Europe appear to belong to the Stone Age."*

"The best known of these is the chambered mound of Mæshowe. Externally it has not the appearance of a cairn, but of a mound, 92 feet in diameter, and 36 feet in height, surrounded by a trench 40 feet wide, and still in some parts, about 8 feet deep." The mound covers an internal chamber 15 feet square. The doorway is built up with a pier and lintel, the roof or ceiling is vaulted, but it has the essential characteristics of other chambered cairns.

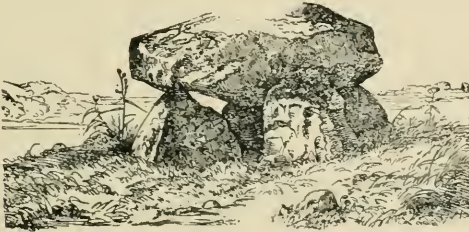
Covered Avenues are often found in connection with other monuments. These subterranean galleries are sometimes 30 feet long, and their height increasing from three to nine feet. A tumulus in Finisterre has two avenues running parallel with each other. In Sweden such avenues form communications

* Scotland in Pagan Times, p. 280. Joseph Anderson.

Many of the chambered cairns have been ascribed to the Bronze Age. The chamber represented in the cut seems to belong to the Iron Age, as it has various Runic lines on its walls, though Prof. Anderson assigns it to the Stone Age.

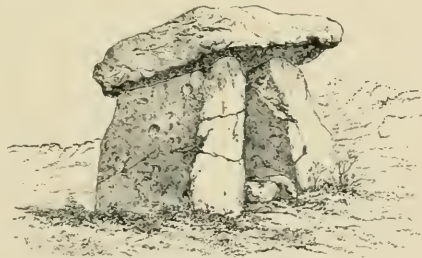
between several dolmens. Subterranean chambers are very common near Paris; some of them covered with mounds. A covered avenue near Antequerra, Spain, is very remarkable. Twenty slabs form the walls five large blocks, the roof, and these pillars are set upright inside the chamber being reached by a passage ending in a small stone cist gallery to support the roof.

V. The most interesting of all the monuments of the Stone Age are those to which the expressive name of Dolmen is given. The dolmens are very widely scattered, a large number of them being found in North Europe, Great Britain, Scand-



DOLMEN IN DENMARK.

inavia, others being scattered along the north coast of Africa, the west coast of Asia Minor, the coast of India, the east coast of Asia, as far north as Japan and China; also in various islands of the Pacific Ocean, and various parts of South America. These dolmens resemble one another in so many respects as to suggest that they were erected by the same people. By what people is unknown. This may be said, however, of them that if the dolmens of Europe are to be ascribed to the Aryan race, it would seem to be a natural conclusion that those of Japan and Peru also belong to the same race, for they are very similar in their character, and are similarly situated in their relation to the seas. There is, to be sure, no proof that the Aryan race ever reached the American continent. The manner of constructing the dolmens varied according to the age and country to which they belonged. The East Indian dolmens are

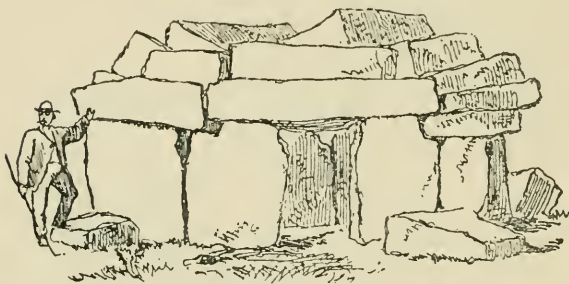


KITS COTTY HOUSE.

said to be identical with those of Western Europe, while those that are found in Scandinavia are of a different character. In Scandinavia the supports are erratic blocks; in India fragments of the rocks in the neighborhood. At Orrys Grave in the Isle of Man, two large stones are so placed as to leave a circular space which was evidently intended for burial. A dolmen in Great Britain called Kits Cotty House is made of two massive slabs with an open space

between them and a heavy slab at the top for a roof. The Danish dolmen was made with four great boulders which supported another boulder or massive rock, which formed a roof. Such dolmens were frequently placed within a stone circle, the circle forming a sort of ring fence which made the burial place in a manner sacred.

In the south of France, we see nothing but rectangular apartments, comprised of four or five colossal stones. The dolmens of Brittany have sepulchral chambers with long passages leading to them. Those in the neighborhood of Paris have wide covered avenues with a very short entrance lobby. The dolmens in Peru resemble those in India and the north of



DOLMEN IN PERU.

France, as they contain rectangular compartments, and have over them roofs formed of slabs arranged in terraces.

The distribution of Dolmens seems to be independent of the course of

large rivers, though they are often placed in sight of the sea. In France they are associated with alignments of standing stones. In Great Britain, there are alignments remote and separate from the dolmens. In Moab, south of Syria, there are many dolmens and many alignments which lead to cromlechs or circles of standing stones. In Japan, there are dolmens which contain massive stone coffins. In Russia there are *kurgans* or tombs surmounted by upright stones, and square chambers beneath massive mounds. In Algeria, the dolmens are surrounded by a double or triple circle of monoliths. The appearance of the dolmens in Peru which so much resemble those in India brings up a very interesting question as to who were the builders of the stone monuments. Here the dolmens are isolated and have no alignments or standing stones connected with them.

CHAPTER II.

THE MONUMENTS OF EUROPE AND AMERICA COMPARED.

The monuments of the stone age, which are found in Europe and America, are to engage our attention in this paper. These monuments are interesting, as they show how the stone age was first recognized and how it came to be established, and at the same time show how the two continents are marked by the tokens of the prehistoric races. It is remarkable that the stone age was known so much earlier in Europe than in America, and yet the resemblances between the two continents have only confirmed the conclusions before reached, and thrown new light on discoveries before made. The monuments of Europe may be said to have furnished the elements of the science, but those of America have filled up with the details. The date of the disappearance of the age was here much later than there, and yet the tokens of the two continents have constituted a series which is most interesting in its nature. We propose to take up the monuments of the stone age, and from these show how important is the history of that age in America.

I. Let us first examine the monuments with a view of ascertaining more about the distinction of the three ages. It is a remarkable fact that this arose from the study of the monuments, though it was soon confirmed by the study of the relics, and latterly the relics have proved to be the most important factors. Various attempts to overthrow the distinction into ages have been made, but so far have been unsuccessful. The history of archæology is interesting on this account. Nearly every leading principle which has once been recognized has remained and become permanent. The foundations of the science are not varying and uncertain, but are well established.

It was as early as 1756 that a remarkable work appeared in Paris, written by Goguet, on the origin of law. In the preface the author says: "When I met with an almost total absence of facts in historical monuments, for the first ages, I consulted what authors tell us of the customs of savage nations. I thought that the habits of those people would furnish sure and correct information concerning the state of the first tribes." He then goes on to speak of the weapons, instruments and ornaments of copper met in certain old graves, chiefly in the north, and comes to the conclusion that copper had been used instead of iron. Later M. De Caumont perceived that stone implements had been in the earliest use, but that copper and bronze had

been introduced before iron. He introduced the expression "chronological horizons" to indicate the periods in the history of art remarkable for their revolutions, or for notable changes in the forms and character of the monuments. He pointed out the following order of succession in the mode of burial: "In the most ancient graves the body of the deceased was doubled up so as to bring the knees in contact with the chin. Later, during the bronze age, the dead were usually burned; during the iron age the body was often laid in the grave stretched at full length."

These thoughts came from the study of Roman remains, and were given in lectures on monumental antiquities. It was reserved to the Scandinavians to open the proper track. Denmark and Sweden teem with antiquities. The ground is strewn with ancient barrows, which are raised like hillocks above the surrounding level. Roman civilization had not penetrated so far. It was an event of note when Mr. Thompson, a simple merchant who was engaged in collecting china, in 1832 published a paper on the antiquities of stone, showing that these objects had been tools and weapons of a people very like the modern savages. He shows that certain sepulchral chambers formed of huge boulders, in which the dead were deposited without being burned, contained stone implements without any traces of metal. This furnished him with his first period, which he calls the stone age. He then goes on to show that implements and weapons of bronze are found in certain graves which differ from those of the preceding period, both by their structure and by their dead having been burned. Hence he deduces a second period, which he calls a bronze age. Next comes the iron age, distinguished by a new system of burial, by the first appearance of silver, by the traces of alphabetic inscriptions, and by a peculiar style of ornament.

Professor W. F. Nilsson, of the University of Lund, was then engaged in studying the fauna of Scandinavia, but he introduced the study of man and his origin. He applies the method, compares the flint implements of the north with those of savages, points out the striking analogy between the most ancient graves in Sweden and the modern huts of the Greenlanders, with a view to prove that the abodes of the dead were imitated from the dwellings of the living. This introduced the topic, "The Successive Periods of Development," during the prehistoric ages. He, however, reaches the conclusion that each of the periods was marked by the invasion of a new race, by a fresh wave of population, inasmuch as there was an essential change in the mode of burial and a profound change in the religious system. The development was not altogether natural and unaided, but was the result of migrations. Thus the primary divisions of the prehistoric period became established.

The order of progress and the law of social development were recognized by the comparison of the structures and relics which

were left by prehistoric races with those of the ruder uncivilized races known to history, a comparison which might be drawn in America much more easily than in Scandinavia or in any portion of Europe.

Thus it was from the study of the monuments that the division of the prehistoric period into three ages occurred. This division was first made by the Scandinavians, but was confirmed by English archæologists and has been adopted by all. It is a division which is recognized in all countries, even in America. Here the iron age is, to be sure, very distinct from the two preceding ages, as it was introduced by the white settlers after the time of the discovery. But there is an advantage in this, for the presence of iron is always a sure indication that the tokens belong to the historic rather than the prehistoric period. The real division in America is into the bronze age, the polished stone age and the rude stone age, leaving out all consideration of iron. The monuments, however, belong mainly to the stone age as such—that is, the polished stone age, and may be regarded as distinctive of the age.

It was, on the contrary, characteristic of the paleolithic age that there were no monuments in it, at least no monuments which have been perpetuated. There may indeed have been habitations in that age, but they were either such abodes as could be furnished by caves or were the mere brush heaps resembling those erected in our day by the California Indians, the rudest of all structures. Some have, indeed, claimed that the huts of the Eskimos properly represent the paleolithic abodes, but this is uncertain. It is possible that they were ice huts, but if so they were very perishable.

This was, probably, during the preglacial period, a period when man may have been without the use of fire, and so exceedingly rude as to be unable to erect any structure which would be worthy the name of monument. We are safe in saying that there were no structures in that age which became monuments. It is, then, to the neolithic age that the majority of the monuments in America belong. These may, indeed, have been left by an uncivilized race, and probably were erected subsequent to the glacial period, but they are scattered over the continent in every part of it. Geographically considered, we may assign the most of them to the temperate zone, placing the monuments of the bronze age in the torrid zone and those which resemble the works of the paleolithic age in the arctic zone, and yet the geographical is not the division which is so distinctive as is the chronological and the geological, the paleolithic age having belonged to a horizon lower down and farther back than the neolithic, the bronze age having furnished the best and the latest monuments. This age appeared among the civilized races of the Southwest, in Central America and Peru, but it was by no means spread

over the continent, as it was over Europe. The bronze age appeared in America very much as it appeared in Chaldea and the regions of the East. It was in connection with an architecture of a somewhat advanced type that it appeared, an architecture in which the corbelled arch, the staged tower (the zikkurat), the pyramid with its terraces, the palace with its seraglio (that is, the salon for official receptions), the khan or the dependencies of the palace, the kitchens and slave lodgings, were the chief elements; a style of architecture which was far in advance of anything which was found in Europe during the prehistoric times. It might have naturally been expected that bronze would have appeared among the Mound-builders or the Pueblos, for these occupy about the same position in the scale of progress that the lake-dwellers in Europe do. But there was lacking here the aid of a civilization which was near and which could by migration, or by transmitted influence, effect the art and architecture of the people. Copper was used by the Mound-builders, but bronze was unknown.

The isolation of the continent prevented the bronze age from being introduced among the Mound-builders. It was evidently introduced among the lake-dwellers of Europe by migration. The migrations in America worked an opposite effect. Instead of bringing a wave of civilization and progress, it brought in a wave of savagery and produced a decline. The earliest monuments were the most elaborate and show the highest stage of civilization. This is the case in all parts of the continent. The mound-builders of the early period were more advanced than the Indian tribes who followed them. The Pueblos and cliff-dwellers were a semi-civilized people, but the tribes which drove them away were savages, hunters who had come in from the regions of the North. The civilized races made progress, but those who followed them were savages, and were surprisingly degraded.

The absence of the bronze from the cliff-dwellings was owing to their distance from civilized and historic countries, for bronze even in Europe was a product of civilization and really belongs to the historic period, though it was introduced, like domestic animals, among the uncivilized races, and prevailed in great quantities in prehistoric times.

This subject of migration is an interesting one. Worsaae says of the stone age in the North: "What people it was that showed the road to the more highly developed races is just as unknown as the time of their arrival." Of the later stone age he says: "The period was long, the new culture alien, and its dissemination gradual. That the stone age culture was able to reach such a pitch in the North can not be explained solely by its longer duration, or by the richness and excellence of material for flint work. In reference to the rise and spread of the bronze age, the facts point more and more toward the ancient culture

lands in Asia, and to India in particular, with its rich veins of copper and tin, as the most probable starting place for the bronze culture." Prof. Worsaae recognized a North Asiatic age of bronze, but thinks that this can not be regarded as the starting point for the bronze culture which appeared in Scandinavia and the rest of Europe. The bronze age in the south-east of Europe was originally introduced by immigration, but it flowed into Europe by two main routes. The southern followed the coast lands, Greece and Italy, Africa, Spain, France and the British Isles; the other followed the basin of the Danube into the heart of Europe, taking Hungary, Switzerland and Germany in its course, and from Germany to Scandinavia. The age of stone preceded the bronze, as whole skeletons with stone age objects are buried at the basement of the graves, while in the sides and summit are burnt bodies with objects of bronze.

As to the migration of the American races we have no real information. That it came mainly by way of Behring Strait is only an inference, it has not been proved. In fact, in later years, the drift of opinion has been in favor of another route, or, perhaps, several routes, Behring Straits being one, Labrador, Greenland and Iceland another, the coast of Florida and West Indies another, Mexico and the Polynesian Islands still another. There are some who take the ground that there was no immigration; the races were all autochthonous. Hellschmidt says: "The procession of migratory races was in the long axis of the continent, from north to south. The migrating tribes always tended towards southerly regions. That America was already inhabited before this great migration, and in many parts was possessed of an ancient civilization, admits of no doubt. If we compare it with that of the present Indians of America, the original culture was much more advanced. The question might arise whether tribes in a state of civilization were the first immigrants, or were the existing races in a lower grade because they had declined from a former civilized condition. The theory of a civilizing migration seems to be opposed by most writers; at least it is denied that civilization was introduced simultaneously with migration, though it is acknowledged by many that the germs of civilization may have been carried with the migratory tribes." The populations of the copper age of America, which had already dawned in the region of the lakes, may have followed the valleys of the Ohio and Mississippi, and directed their steps to the present States of Louisiana and Texas. Still this wide region of the Mississippi Valley, the proper home of the Mound-builders, preserved no trace of immigration or emigration. The shifting of place among the tribes is manifest, but no long line of migration. The Asiatic hordes moved slowly during the early periods of history. It may be that the stream, set in motion, may have ultimately reached this conti-

ment, and poured itself from the north over the region which had been previously occupied by another race. This would account for the decline, and for the super-position of the skeletons and the strata of relics being in the reverse order.

II. The distinction between the paleolithic and neolithic age is to be recognized in America. Let us, then, take up this distinction as the especial object of our study. The paleolithic age found man at the outset a mere homeless, houseless savage, scarcely above the condition of the beast. He dwelt in caves, protected himself with a rude booth or found shelter near a rock or tree, and possibly dug a hole in the ground, and burrowed there. But nothing that was worthy the name of structure or monument was erected by him. He did not even lift up a stone which would serve as a monument, nor did he place a mound upon the surface, so that there are no monuments of him. Later in the paleolithic age he resorted to caves, and there left the traces of his presence in relics of various kinds. He seems to have been acquainted with fire, and had some skill in drawing pictures upon bone and rock. The latest stage was that in which he erected a hut by the sea coast, and threw out the bones and shells which accumulated around the hut, leaving rings in the heap to show the place of his habitation; this is the nearest approach to architecture which the paleolithic man reached. The neolithic age introduced a new epoch. There was a great change, both in the condition of man and in his surroundings. It would seem almost as if the change was one of climate and of natural environments. Certainly, so far as the animals are concerned, there was a great contrast. The bones of the extinct animals, such as the mastodon, the cave bear, the rhinoceros and the elephant, are never found associated with the neolithic relics. On the other hand, the neolithic structures, such as dolmens, menhirs, stone graves, hut rings, lodge circles, must have been built by a race very different from the paleolithic man. He was undoubtedly a wild hunter, who was clad in skins, with the hair side out, and who was shaggy in his appearance; he may have contended with the mastodon and the cave bear, and he had only the rude spearhead, which belongs to the paleolithic type, for his weapon. When, however, these animals disappeared, he either disappeared himself, or else changed his habits in almost every particular. It would seem as if a new race had been constructed, for the whole horizon has changed. There are now habitations which are placed upon the surface of the earth, and within those habitations are tools, utensils and weapons, which are as different as the surroundings. This change was probably brought on by a variety of causes. Everything is correlated in the prehistoric world. Man may have been either a hunter or fisherman; he may have dwelt upon the sea coast or in the interior; he may have inhabited either of the continents; yet when he moved from the cave

to the constructed house, he came into a new social condition. The date is not known, but the change is easily recognized. There is a new phase of social life, and everything partook of it. The skill of man was exercised not only upon his architecture, but in the department of art, the habitation and the tools changing about the same time. We cannot say which was first, though judging from the ease with which savages take up the use of new weapons and tools which have been introduced by the more civilized race, we should say that the change from the paleolithic to the neolithic relics must have been anterior to that of the change from the cave to the constructed hut. The gradual progress might have produced an improvement in axes and adzes before they were used in cutting down trees or gouging out canoes. But we imagine that necessity was in this case the mother of invention. Domestic utensils probably came into use about the same time that cooking over the fire was practiced, and so we infer that pottery was introduced about the same time the hut began to be built. The garments also changed when the change in habitations and tools had occurred. The discovery of bone needles and awls and stone drills and knives, as well as the presence of perforated tablets and other ornaments of dress, would indicate this. The change from the cave to the hut involved a new method of defense. We accordingly find weapons of a different kind, spearheads, arrows, dirks, knives, showing that the warrior was well equipped. We do not know as there was any fortification erected at this time, for there are savages in America who found their safety in flight, and who rarely undertook to build a fortification. Still we regard it as characteristic of the neolithic age that man was then able to provide means of defense for himself; there was also a change in the religious condition of the people. It is said that during the paleolithic age there was much skill in depicting the animals, as in imitating their shapes, but the symbolic figures which would make animal totems are very rare. In the neolithic age there is a great abundance of totems. Nearly all of the animal figures which are found depicted, inscribed upon bone or carved or moulded, are totemic in their character and may be regarded as symbols of the primitive faith. These are the characteristics of the neolithic age. They are characteristics which are given by the relics, ornaments, garments, art products, as well as the structures of the age. We are, however, only to describe the structures. We therefore proceed with the description of these.

III. This brings us to the monuments of the stone age in America.

The division of the antiquities of America has been made on the basis of the material of the relics. It can be, however, made on another basis, namely, on the material of the monuments. We have already elsewhere shown that the monuments

of America are to be classified according to the geographical location, those of the north being mainly of perishable material, wood, ice, bone, bark. As a result we find very few prehistoric structures here. Those of the Mississippi valley were constructed mainly of earth, though occasionally a few rude stone walls and mounds were found among them. Those of the interior, in the great plateau of the west, were of stone, unwrought, laid up in walls, and of adobe, but with no wrought stone and no lime mortar among them. Those of the south were mainly of wrought stone, laid in cement, with many carved ornaments and sculptured pillars. Thus it appears that the material of the structures, as well as the location, furnishes an index to us of the grade of culture which prevailed, so that we do not need to rely upon the material of the relics. These might be regarded as the subdivisions of the stone age, though they would lengthen out the stone age, and make it overlap the bronze in one direction and the paleolithic or rude stone in the other. This is the main point which we make.

1. We take up first the structures which are presented by the kitchen middens and shell heaps. These are supposed to have been the earliest and most primitive, the rudest of all. It has been, to be sure, a matter of discussion whether the shell heaps antedated the burial mounds and sepulchral constructions, but on this point most of the archæologists are now agreed. Prof. Worsæ and Prof. Steenstrup were appointed to examine the shell heaps on the coast of Denmark. They made their report. One of them claimed that the shell heaps marked a period which preceded that of the dolmens, cromlechs and other stone monuments. The other maintained that they were contemporaneous. The same discussion might be carried on at the present time in reference to the shell heaps on the coasts of North America. It would not be a question whether they belonged to the stone age, but whether they do not mark an early part of this age. In reference to some of them there would be no dispute, but in reference to others there would be a variety of opinion. Sir John Lubbock examined the shell heaps on the coast of Denmark. He speaks with the highest praise of both gentlemen, but reaches the conclusion that shell heaps or kitchen middens represent a definite period in the history of the country and are probably referable to the early part of the neolithic stone age. He says none of the large polished axes have been found in the kitchen middens. The absence of metal indicates that they had not yet any weapons except those made of wood, stone, horn and bone. Prof. Steenstrup admits that the stone implements from shell mounds are ruder than those from the tumuli, but the frequent remains of the seal and wild ox, and the cuts which are so common in the bones, indicate the use of polished implements, and so he regards the shell heaps as marking the camping place for fishermen, but belonging to the same

age as the tumuli. The kitchen middens were not mere summer quarters. The ancient fishermen resided on these spots at least two thirds of the year. The same is true of the shell heaps in this country. There are shell heaps in Florida which cover immense tracts, and which reach great heights. They are situated along the coast, showing that they were not merely the result of the accumulation of debris, but were often built in ranges, so as to give protection to the inhabitants from high tides and at the same time furnish an airy and sightly place for residence.

The examination of the shell heaps of Florida was first made by Prof. Wyman, of the Peabody Museum. They have been frequently visited since that time. Dr. D. G. Brinton has described those at New Smyrna. He says the turtle mound is thirty feet high, and is composed altogether of separate oyster shells. A remarkable mound on Crystal River is in the shape of a truncated cone, for y feet in height, the summit thirty feet in diameter, the sides nearly perpendicular. The great size of some of these accumulations may furnish some conception of the length of time required for their gradual accretion. The one at the mouth of the Altamaha River covers ten acres of ground, and contains about 80,000 cubic yards. Mr. S. T. Walker has described those on Tampa Bay; he says they extend along the shore for several hundred feet, and are from fifteen to twenty feet in height. Here the archæologist may read the history of the people, as the geologist reads the history of the earth in the sections presented. The peculiarity of these shell heaps is that human bones are found in them, while very few bones are found in the kitchen middens of Denmark.

Canals have been found in these shell heaps, giving an indication that the people who built them navigated the sea coast, and then crossed the narrow neck of land which separated the coast from the river. It is supposed, also, that there were landing places for canoes, and that the shell heaps were raised above the surface, both for the sake of safety and comfort. We give cuts of some of these shell mounds. One of them has a roadway running from the level to the summit. See Fig. 1. The dimensions of this mound are as follows: It was about five feet high; entire length one hundred and fifty feet; breadth seventy-five feet; the roadway is twenty feet wide; there is a ditch or excavation at one end which enters the mound. A roadway was traced from the mound into a hummock several hundred yards. Another mound, twelve hundred feet long and twenty feet high, has a beautiful inclined road up its west side. The turtle-shaped mound is the most remarkable. It is about five feet high, and is surrounded by ditches; lengthwise of the ditches are walls left at the natural level of the land, which correspond to the flippers of the turtle. The head and tail are projections from the mound itself. The entire length of the

body is one hundred and eight feet, the width sixty-six feet. It is remarkable that carved relics resembling this mound in shape have been found in the shell heaps of Florida.*

These observations confirm what we have said about the characteristics of the neolithic age. They show that totemism or symbolism prevailed extensively. The shell heaps of the California coast differ from these. These contain extensive graves. It is supposed that they were temporary residences, as layers of sand recur at short intervals, as if they were visited at stated seasons. Still, there are traces of aboriginal settlements, since the graves are numerous and many skeletons have been exhumed. Many relics, also, have been taken out—beautiful serpentine pipes, spear-heads of obsidian, a bronze cup filled with red paint, mortars of various kinds, shell ornaments, mica pots, ear ornaments, beads, lance-heads, etc. The shell heaps of the northwest coast were much ruder than these. These, however, contained some remarkable relics, showing that they were of modern origin. Prof. E. L. Morse says: "That these deposits are not all of the same age is certain. It can be safely assumed that they were made long before the advent of the European, for the natives were then living in the shell age, and were forming depositories of shell in the same way. These depositories have been described as occurring in England, Scotland, Ireland, France, east and west coast of the United States, Australia, Tasmania and the Malay archipelago, showing that the stone age prevailed extensively over the globe. The hut rings which are found in the mounds of Florida, and the artificial shapes of the mounds themselves, bring them under the department of architecture; but the rude relics and animal remains found in the shell heaps of Scandinavia, Japan, as well as of the northwest coast, show that some of them are to be treated under the most primitive department of archæology."

Kitchen middens are sometimes classed with the paleolithic and sometimes with the neolithic age. This illustrates a point. There was a time when the fishermen were so extremely rude and low in their social condition that they were incapable of erecting a structure which required any mechanical skill. They either dwelt in caves and resorted to the sea coast during the summer months, or they made for themselves shelters of the rudest kind. We can hardly regard them as equal

*Shell heaps with bone implements and rude pottery are common in Florida.—Wyman, Peabody report, Vol. II. Shell heaps with steatite mortars have been discovered in California. One in Contra Costa County was more than a mile long.—Baneroff, Vol. IV, p. 709. Peabody report, 1878, Shellheaps in Oregon. A Steatite stone quarry with 2000 stone implements and hammers was found in Pennsylvania. The Steatite pots in the shell heaps of California and Oregon may have been taken from the quarry in Santa Catalina Islands, see Peabody report for 1878. Shell heaps with wooden hammers have been found in Vancouver's Island, Baneroff Vol. IV p. 737. On the coast of Brazil are shell heaps which present evidence of cannibalism.—Naudillac, p. 53. Fresh water shell heaps are common in the valley of the Mississippi, Report of A. A. A. S. 1873. These are to be distinguished from the ash pits found by Prof. Putnam in Ohio, and yet they contain the debris of camps, as do the shell heaps elsewhere.

to the house-builders in their condition, for the house-builders belonged to the neolithic age.* To have had neolithic weapons and tools, and build houses would imply an advanced stage of art and architecture. The Eskimos build ice huts which are arched, resembling the conical stone huts which are found in Ireland, and which belong to the stone age. They also make long passages to their huts, which remind us of the passage-ways to the dolmens of France, which are also neolithic structures.

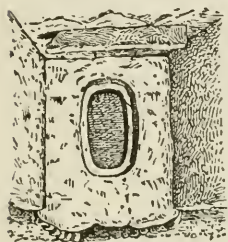


Fig. 4.

In winter the Eskimos build huts from whale bones and walrus bones, laid in tiers, the same as the ice, and placed upon a foundation of stone. This shows that the Eskimos had very considerable skill in the art of constructing houses, a skill which probably represents that which was exercised by the early neolithic people of Europe and of America. Our conclusion is that the structures which were erected in the midst of the shell heaps were similar to these, and that they belonged to the neolithic age, but were perhaps the earliest structures of that age.

2. We now turn to the barrows and mounds which are found on this continent, with the design of instituting a comparison between them and the so-called barrows of Europe. We place them together, for they constitute a second class of monumental structures, and illustrate a second division of the new stone age. It is remarkable that in the barrows there are so many stone chambers which were evidently designed for funereal purposes. These chambers are rude specimens of funereal architecture, but they show how sacred and important this kind of architecture was in the stone age. The mounds of America do not often contain chambers like these, but, on the other hand, are solid throughout, either stratified, with layers of sand, earth and stone, or built as simple heaps of earth, without stratification, and sometimes without relics or remains. The barrows of Europe are supposed to contain the oldest or earliest of all funereal structures, and are on this account worthy of especial study. The architecture of the prehistoric seems in this respect to have resembled that of the historic age. The most ancient in each are tombs. This is an interesting fact. Tombs are found in the pyramids of Egypt, the earliest of historic monuments. They are also contained in the barrows of Europe, the

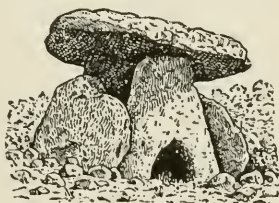


Fig. 5.

*The Californians connect a tradition with a shell heap near San Francisco of the Hohgates, seven mythical strangers, who were the first to build houses. These strangers were changed to stars, but the shell heaps are left as signs of their former residence.—Bancroft, Vol. III, p. 177.

earliest of the prehistoric monuments. There may indeed have been structures which were occupied by the living at a time preceding these, but as these were built of perishable material they soon disappeared. The significance of the megalithic tombs is, however, the greater on this account. They are supposed to have been built after the pattern of the houses which have perished, and so show what kind of houses were built during that age.

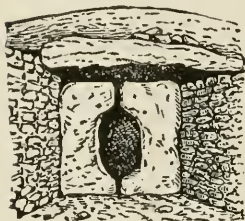


Fig. 6.

Lubbock says: "No one can compare the plan of a Scandinavian passage grave to any drawing of an Eskimo snow house without being struck with the great similarity existing between them." Prof. Nilsson says that the winter dwellings of the Kamskatkans are very similar; that these are a copy of the dwelling house. The ancient inhabitants of Scandinavia, unable to

imagine a future separate from the present, buried the house with its owner, and the grave was literally the dwelling of the dead. When a great man died he was placed in his favorite seat, food and drink were arranged before him, his weapons were placed by his side, his house was closed and the door covered up, sometimes, however, to be opened again when his wife or children joined him in the land of spirits. The entrances or doors to dolmens are usually made by omitting one of the upright supports, but is closed by inserting a moveable stone. There are dolmens with a different entrance. A hole is cut through the door, or closing stone, sometimes round and sometimes oval. Sometimes the hole for entrance is cut out of the bottom of the closing stone. Figs. 4 and 5. Some dolmens have an entrance cut one half out of each stone, making an appearance like the guillotine, and so giving the name of guillotine to the tomb. See Fig. 6. There are a few dolmens which have doors with side

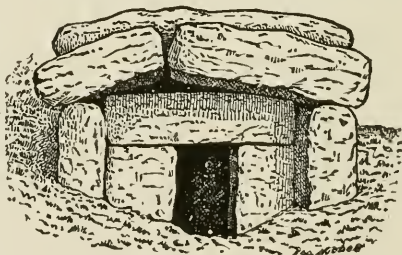


Fig. 7.

posts or piers and lintels, and with the superincumbent stone sloping like the roof of a modern house. See Fig. 7.

Thomas Wilson says it is usual, if not universal, to find a vestibule corridor or covered way leading from the entrance of the principal chamber to the circumference of the tumulus. Some of these corridors are forty to fifty feet in length. He says many of the dolmens are covered with earth. All may have been once so covered. The following cuts will illustrate the manner in which these dolmens are built. Figs. 8 and 9.

These dolmens were found in France. The village in sight is that of Lochmariaquer; beyond is the gulf of Mordihan. The road from hence to Carnac is lined with monuments of prehistoric times resembling these. There are no such dolmens in America. The nearest approach to them is found in the chambered mounds of Missouri, but these lack the passage-ways or corridors.

A distinction was formerly drawn between the long barrows and short barrows, as if they indicated different races and periods of time, but this has been done away. The passage graves and stone chambers within the mounds may, however, be distinguished from the stratified mounds and burials without stone cists, a distinction which will apply to the mounds of America as well as of Europe. The reason assigned for the

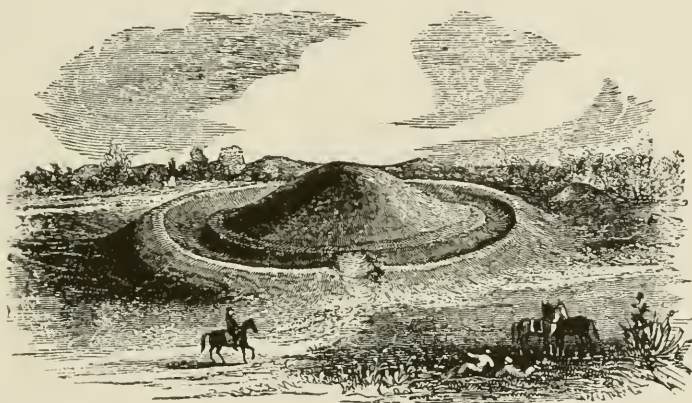


Fig. 10—Mound and Earth Circle near Portsmouth, Ohio.

construction of passage graves is that there might be a succession of burials without a destruction of the tomb. The opening to the mouth of the passage would be so near the outside of the mound that the stone could be removed and new bodies placed within the tomb.

There is one point which comes up in connection with the mounds of America and the barrows of Great Britain. Some of these were associated with earth circles (Figs. 10 and 11), showing that the people who erected the barrows were a military or war-like people, and that they erected these as a means of defense. In this respect they are supposed to have been one degree in advance of the people who dwelt among the kitchen middens, who were probably fishermen. The same thought is conveyed by the mounds found in the United States. Many of these mounds were evidently used as signal stations, showing that the people were both hunters and warriors, as the same mound would serve for observatories to watch the approach of

game, and to notice the presence of the enemy. The earth circles in England are attended with standing stones. In this country there are no standing stones. The ditch, however, is inside the circle as in Europe. It is supposed that the circles in both countries were designed for fortifications, though some had evidently a religious use. The religious significance of these structures is perhaps more important than the military use. It is possible that there was a symbolism concealed in the very space of a circle, the circle being the symbol of the sun. It is possible, also, that the standing stones found in Europe symbolize serpent worship exactly as certain earth walls and mounds symbolize it in this country. Altar mounds are numerous in the United States. These show that the religious sentiment was a powerful factor in the erection of mounds. There are no altar mounds in Europe, but there are many who suppose that the dolmens were both altars and burial places, the table-stone above the chamber serving for an altar and the chamber serving as the burial place for the dead.

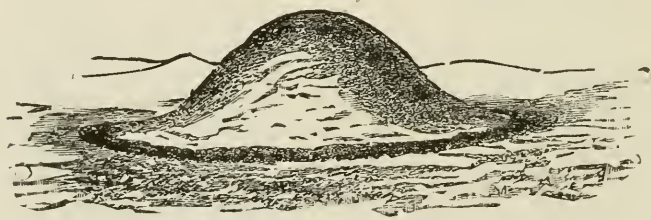


Fig. 11.—Mound and Earth Circle in Great Britain.

There is another thought which arises here. We have noticed that the kitchen middens of Europe are much ruder than the chambered barrows, and have spoken of the caves as partially filling the gap. In America, however, the gap is not so wide and is partially filled by the stratified mounds, these mounds being of a lower grade of architecture than the chambered barrows but of a higher grade than the shell heaps. It was during the mound-building period that the so-called copper age appeared. This age has not been assigned any definite position, and in fact some even deny that there was any such age in America. It remains then for those who are studying the science in America to say what that age was. The comparison between the European and the American mounds helps us to do this. The Mound-builders represent the copper age. The Mound-builders were both hunters and agriculturists. They erected mounds for burial, but they also built earth walls for defense. They evidently lived in villages, while they cultivated the land surrounding them. They were also house-builders, and at times built council-houses and temples in the midst of their villages. They were sun-worshippers, and at times built altars and presented offerings

to the sun divinity. The use of copper may indeed have been only incidental to their life, the abundance of copper being a reason why they used it rather than stone, and it also better served their purposes. Still we use the term as significant of a cult, and place the copper age in the midst of the stone age, making the Mound-builders to represent its rank in the column.

We give a series of cuts to show the resemblance between the mounds of America and the barrows of Europe. It will be noticed that some of the mounds are surrounded by earth circles with a ditch inside of the circle. Some have thought these to have been symbolic structures—symbols of the sun; others consider them mere burial places. There are many such mounds in the United States. Some of them contain altars, and all have a sacred or religious character. We call attention to the resemblance between these circular enclosures. Was it because sun-worship existed that these rings or circles were built, or was there some actual contact between the two in the two continents. The standing stones of Great Britain are wanting in America; but so far as the form of the earth circles and the passage-ways to the circles can be said to resemble one another in one country, they may also be said to resemble one another in both countries. The altar mounds are, to be sure, wanting in Europe, and yet if we take the stone tables to have been altars, we find the same use for the barrows as for the mounds. They covered up and preserved the altars as well as the burying places. We here call attention to the circles, at Avebury, in England, and the earth circle in Portsmouth, Ohio. We do not say that these works were symbolic, and yet the religious use is acknowledged by all and the resemblances are also striking.

3. This brings us to the stone structures in Europe and America. We must treat these briefly. The rude stone monuments have been described as if they constituted a very important factor in the prehistoric architecture of Europe. The rude stone structures are, however, very numerous in America. These are more properly ruins than monuments, and yet they belong to the same age and represent a similar stage of progress with the so-called monuments. We mention the cliff-dwellings and pueblos of the west, as we do the standing stones of France and the cromlechs of England, placing them side by side, since they all represent the last subdivision of the so-called stone age. Descriptions of these works are found in works on archæology, and yet the resemblances are worthy of our study. The standing stones at Carnac, called alignments, have, to be sure, no representatives in America, and the Pueblos have none in Europe. Yet it may be noticed that the same skill which wrought one class was also exhibited in the other, so that a department may be erected for both. The uses of the pueblos, with their many storied rooms, and with their sacred estufas or sweat houses and

their plazas or courts are indeed better known than are the uses of the standing stones. The uses of the cliff dwellings with their retreats in the sides of the rocks, and their lookout towers on the tops of the same, are also perhaps better known than are the uses of the stone circles of Avebury or Stone Henge.

Yet with all the mystery which hangs about the European monuments, we do not hesitate to class them together. The mode of life of the two people was, to be sure, in great contrast, since the means of subsistence in one case was gained by irrigation, and in the other by agriculture of the ordinary kind, defense being secured in very different ways in the two countries, yet so far as skill in architecture or general culture and the prevalence of a certain religious cult are concerned we should place them all on the same level. It is possible, too, that original design of the European monuments may yet be learned from the study of these American structures, and so we call attention to the two as worthy of close attention. We call attention to the cuts as illustrating this point.

We call attention to the cuts, Figs. 12 and 13. These represent the circular structures of the two continents; the one, the standing stones of Great Britain, the other the ruined towers of Colorado and New Mexico. The standing stones were never buildings, and yet they may have been places of worship or of religious assembly. The towers, however, were once buildings, but buildings of a singular kind. They may have been lookout towers, but more likely were sweat houses or sacred places of assembly where sacred rites were observed. These towers are sometimes found on the mesas above the so-called cliff-dwellings and sometimes on the bottom land beneath the cliff-dwellings, and sometimes isolated and separate from all other structures. The significance of the circle in both cases is that sun-worship prevailed in both continents.

Some of the towers have three concentric walls, as in the cut; others, however, have only two, but with partitions between the walls, dividing the tower into one large central apartment, with several cells surrounding this. The standing stones at Stone Henge were also surrounded by a circle of earth, with a ditch inside of it. They seem to have had a sacred assembly place in the center, in the midst of which was the so-called altar. This was the penetralia of the place. The analogies of the two are, then, very striking, especially when we consider the distance which separated them and the difference in the surroundings of the two. The subject is certainly worthy of serious study, as they may be expressive of a wide spread cult.



Fig. 8.—Dolmen of Grand Island, France.

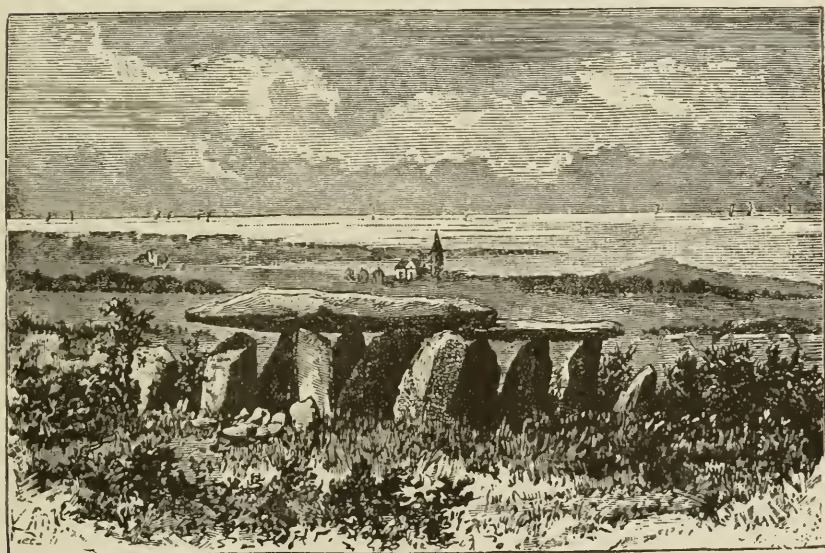


Fig. 9.—Dolmen of Lochmariaquer, France.

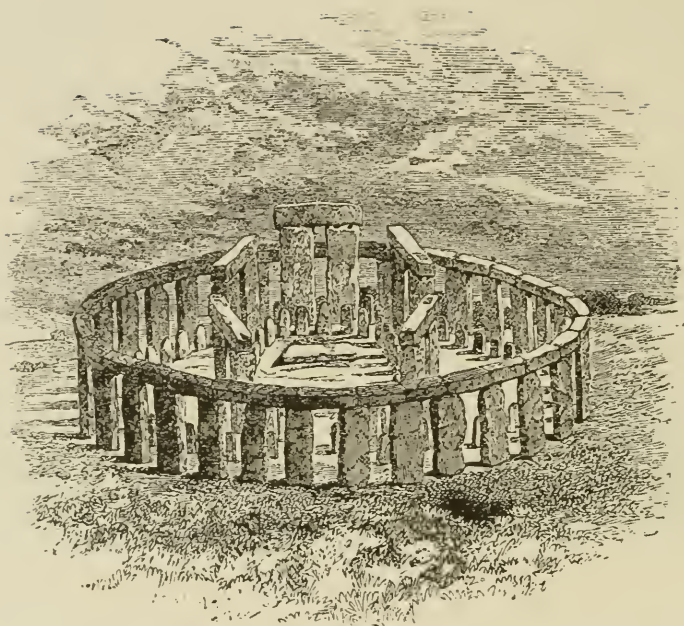


Fig 12.—Circlet at Stone Henge.

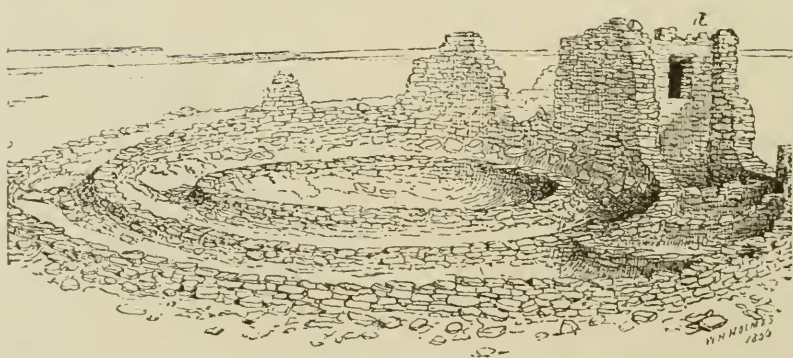


Fig. 13.—Ruined Tower.

CHAPTER III.

THE EARLIEST HOME OF THE HUMAN RACE.

There are two views of the earliest home of the human race, and of the locality from which all the migrations started, one of which has come from the study of prehistoric archæology, and the other, from the study of history, traditions and architectural remains.

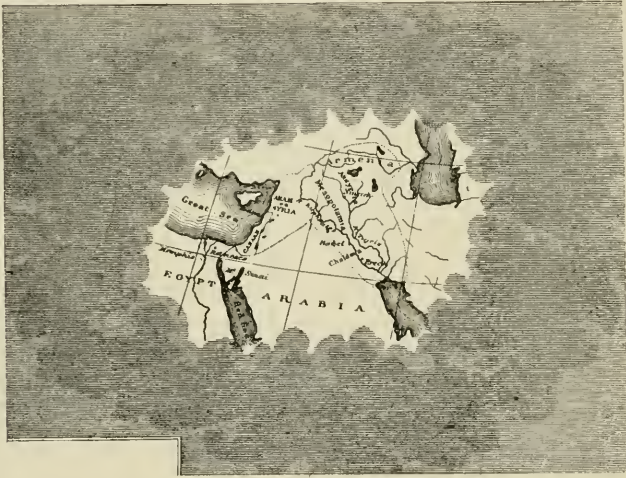
According to the first view, the starting point was somewhere in Europe, and the caves were the earliest habitations; according to the other view, it was, in southern Asia. In fact, man's earliest home was in a region where the climate was mild, and where vegetation was abundant and every thing seemed like a garden. This is the traditionary view, and one which in reality comes from the sacred scriptures; but it is also the view which is receiving the assent of a large number of scientific men, and is confirmed by the discoveries that have been recently made in the valley of the Tigris. It is remarkable that, after the effort had been made to prove that the starting point was in Europe and that the migrations went in the other direction, at last, the original view held by the ancients, and which was given by the sacred scriptures, should be set back again into its place, and we should find that the spirit of inspiration has given to us the correct account.

It may be held by some that this only proves the modern date of the Books of Moses, and that the Bible only reflects the advanced thought of the people who lived, perhaps, even after the time of the exile. There are, however, so many correspondences between the scripture account and the ancient mythologies, that we are led to believe that this view of the early condition of mankind and the locality where the first pair had their home, really embodied the facts which were known to all the nations of the East.

This is the point to which we will call attention, but in doing so, we shall draw the proofs from many sources.

I. According to the Greek mythologists and poets there was a garden called the "Garden of Hesperides," and it contained a tree which bore golden apples and was guarded by the dog Cerberus and the many-headed dragon, although the location of the garden is not definitely given. Various theories have been advanced in reference to this point, for according to some, it was in the remote western part of Africa, in Lybia, or on Mt. Atlas; according to others, it was in Cyrenaica, the

table-land of Africa; and according to still others, it was in the extreme north, and answered to the "sacred mountain" of the Hindus, Mt. Meru, which is spoken of by Isaiah. According to the Greeks it was called Arcadia and was situated in a mountain region, resembling that of Greece itself, for it was full of never-failing springs and rich pastures, and was occupied by a race who never abandoned the pastoral life, but lived in the simplest manner, leading their flocks and herds through the rich valleys and up the mountain heights, and always retaining their innocence and simplicity. It is to be noticed that this story of the garden and the tree and the serpent is found in the myths and symbols of all nations, even those which are situated in the far north of Europe, and the interior of America and the islands of the sea. This is difficult to account

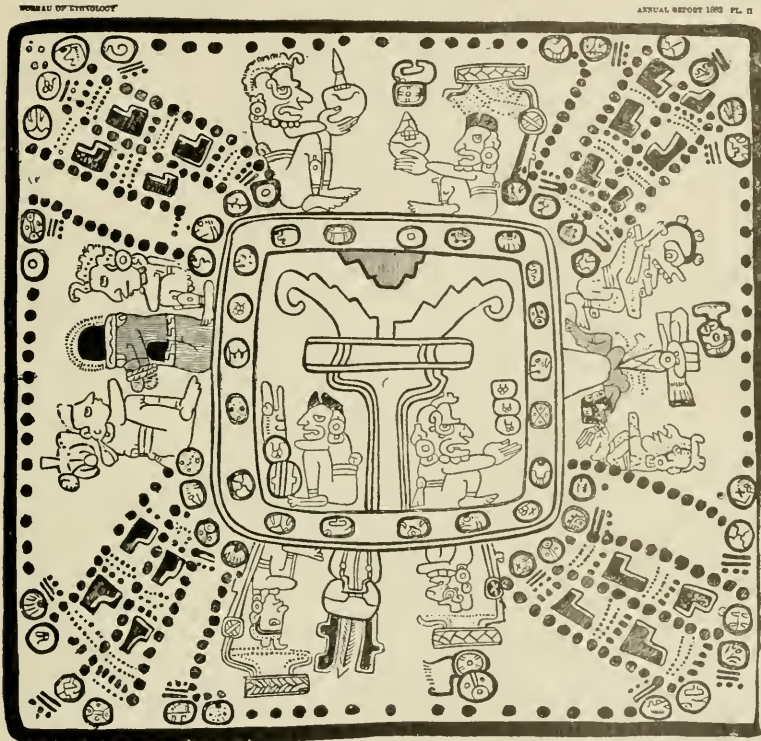


EARLIEST MAP OF THE WORLD.

for, unless there was a common starting point for all the races of the earth, and the same story was known to the ancestors of all. It is a strange coincidence that in Central America one of the most prominent symbols contained in the ancient codices, is that of a tree, with a bar across its branches, making it resemble a cross, while two persons are seated at the foot of the tree—male and female—who seem to represent our first parents. The story connected with them does not refer to the Garden of Eden, and yet the picture is plain, and the significance of the symbols is quite suggestive. This would not be so strange, if there was any historic connection; especially such a connection as is found between the Scandinavian mythology and the story of the Garden of Eden. The Scandinavians belonged to the Indo-European race. But here is a nation

situated in Central America which was entirely separate and distinct from all historic nations, and yet the symbol of the tree is as plain in its significance as the story itself, and can be accounted for only on the ground of a transmission from distant regions and a survival throughout all changes.

II. Another confirmation is gained from the study of the ancient traditions of the East. These have been transmitted



THE TABLEAU DES SACAD RESTORED.

TREE IN THE MAYA CALENDAR.*

to us by the various historic nations,—the Phœnicians, Assyrians, Babylonians, Hebrews and Greeks,—and echoes of them by the tribes of the American aborigines.

1. The event which is the most prominent in the traditions of the world, is the Deluge. This seems to have been local, though it was so early that the tradition of it was preserved by all of the nations of the East before they separated. Each nation has a different version of the story—the Babylonians,

* The chart is taken from *Calendar of the Mayas*, and represents the yearly sacrifices. The dots and circles at the corners give the number of days in the weeks; the circles in the band around the tree, the number of days in the month; the figures at the side show the four sacrifices; these contain also symbols of the elements, the earth, air, fire, and water. The seated figures, beneath the tree, represent the Divinities, and yet they are significant of the first pair.

the Hebrews, the Greeks, the Chinese, the North American Indians, the inhabitants of Polynesia—but at the same time one that contains the same facts. According to the Hebrew tradition, the ark was filled with the various animals—domestic and wild,—Noah and his three sons and their families, and after forty days of rain, it lodged among the mountains of Armenia; the animals were let out, and Noah made sacrifices and, with his household, began to people the world anew.

The Tower of Babel, according to the tradition, was erected by the descendants of Noah; but the confusion of tongues put an end to the work, and the people were scattered to the various parts of the world. It is worthy of notice that recent discoveries have brought to light the fact that there were two or three great nations represented at this time in the valley of the Tigris, the Accadians, who were the ancestors of the great Turanian race; the Mineans, who were, perhaps, the representatives of the Papuan and Hamitic races, and the Hebrews, who represented the Semitic race; and the explanation of the event, is that the nations spoke different languages, and the confusion of tongues was owing to this circumstance. A supposition is that the Accadians went northward, and ultimately established the great Chinese Empire; the Mineans went westward and became the earliest inhabitants of Arabia; but a large proportion of the Semitics remained in the valley and established the Babylonian and Assyrian Empires.

The story of the Flood is not confined to the scriptures, or to mythology, for a tablet was discovered in the depths of a pyramid in Babylonia, by Mr. George Smith, which gives the Babylonian version written in the cuneiform language, and evidently very ancient. This Babylonian version lacks the simplicity and beauty of the scripture record, and yet it contains the same facts. The Hebrew narrative makes no definite mention of Noah's home, but it harmonizes with the statements of the Babylonian story, and admits the possibility that Babylonia was the locality. There is one other strange confirmation: it is found in the fact that mountains surround the valley of the Tigris, those in Armenia being the nearest. The accounts disagree as to the landing place of the vessel, and yet the cuneiform narrative confirms the Hebrew story. It may be objected that the art of ship building had not reached so great perfection, as to admit of the building of so large a vessel, but all the accounts agree in substance on this point, and make it apparent that ship building, as well as pyramid building, had become common.

The Babylonian seals give the idea that wheeled chariots were in use at a very early date, though after the time of the Deluge, for the god Marduk, who was the chief divinity of the Babylonians, is represented as riding in his wheel chariot, with a spear in his hand, and charging at the dragon.

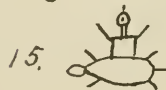
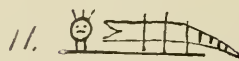
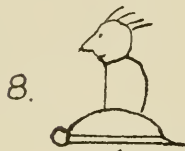
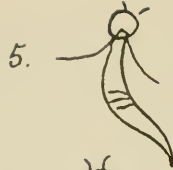
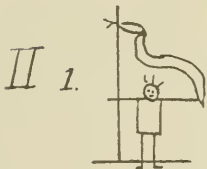
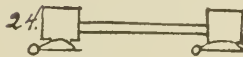
2. There are other traditions which confirm this same point.

The most interesting one, is that concerning the contest between the two brothers, Cain and Abel. This has been explained as referring to the contest between the shepherds and the agriculturists, this interpretation being sustained by the fact that Cain went out and built a city. It is singular that the story of the two brothers is common in all parts of the world. In some places it represents the contest between the east and the west; in others, it represents the conflict between the various elements, and is a personification of the Nature powers.

The building and founding of the city of Rome is attended with the story of the two brothers, the younger of which was slain by the older. It is a remarkable fact that a hut-urn is preserved at Rome, which represents the shepherd's hut in which the two brothers found refuge after they had been nursed by the wolf in the forest. These are reminders of the three conditions of society: the wild life, the shepherd life, and the agricultural life; all of which were followed by the founding and building of cities. Tradition everywhere proves that there was as slow progress of society through different stages in the East, as may be found in the West. The history of mankind has everywhere been attended by the same results.

There are certain details about the story of the Flood and of the confusion of tongues, which are difficult to account for, yet the event is confirmed by the monuments, as well as by tradition. First, the very tower, or temple, called Ziggurat, has been discovered at Nippur, on which tradition shows the confusion of tongues occurred. Second, the tablets, which show domestic oxen at the watering troughs, and horses attached to war chariots, show that domestic animals were common in Babylonia at an early date. Third, the introduction of horses into Egypt, and of horses and oxen, and fruits and grains, among the lake-dwellings proves that they were introduced from the East. Fourth, the fact that the valley of the Tigris is the only place where the remains of the Stone Age have not been found, proves that civilization first prevailed here. Fifth, the fact that the story of the ark has been preserved among nearly all the nations of the earth, proves that their starting point was in this traditional spot, though the details of the story varies, according to the locality and the social condition of the people who hold it. It is remarkable that even in America, the story of the Flood is very prevalent, but it varies among the different tribes. The wild tribes of the east have one version; the civilized tribes of the southwest have another, and the tribes of the northwest, still another, each of them having their own method of perpetuating the story.

3. It is interesting on this account to examine the picture-writing and the symbols still in existence among the American tribes, and see how closely the story contained in them corre-



sponds to that which comes to us from the far East. The Iroquois and Delawares have the bark record called the "Red Score," upon which is recorded the story of Creation, the Temptation, the Deluge, the Rescue, or survival from the Deluge, and the re peopling of the earth, in which the chief divinity called *Manabozho* serves the chief part. This has been explained in the book on "Myths and Symbols," and a cut which represents a part of this bark record is given here, so that the reader may study it, and see how it corresponds with the story given in the scriptures; the imagery being just such as an uncultivated people would be likely to understand and appreciate. The same story is contained in the Calendar Stone of Mexico. In

the center of this stone we find symbols representing the four periods of Creation; one of which was after the world was destroyed by the flood. There are other pictographs in America, which represent Noah and his family in the ark, at least, such is the interpretation given to the pictures by those who are familiar with them.

There are many other traditions of the Flood which furnish proofs that the different races must have once started from this central point. The Phœnicians, the Greeks, and the Hindus, all have the same story.

III. There are many other proofs of this same point, among which we mention the origin of the different alphabets. It appears that the Babylonians had one style of writing—the cuneiform; the Egyptians had two styles—the hieroglyphic and the demotic; the Phœnicians, the Hebrews and the Greeks had the phonetic alphabet; the Chinese had a monosyllabic style of writing, each character containing a word, made up of a combination of symbols or characters. The Phœnician alphabet is the one most relied upon to illustrate the progress of the civilization of the world, and especially the progress of architecture in the Old World. In this alphabet we find pictographs which represent the earliest form of the house, as the letter B, or Beth, signifies house, and the very shape of the primitive house or tent, with the open door and round roof, is given by it. The letter D, or Daleth, signifies the door, and represents the triangular opening to a tent. The two letters here illustrate the difference between the door of the tent and the door of the house. The letter E, with its bars horizontal and upright, represents the window of a house. The Phœnicians are said to have borrowed their alphabet from the Egyptians and transmitted it to the Hebrews, though Cadmus is said to have been the inventor of the alphabet. The shape, however, of the Greek and Hebrew letters show that they were invented after the people had become familiar with the different parts of a house, and after they had given up the hut for the frame house.

There are pictures of houses on the rocks of Babylonia, which show that the earliest houses there, were conical in shape, and resembled the conical huts which are still common among the wandering tribes of Tartars and other Northern people. They also resemble the conical huts found among the North American Indians; whereas, the house which is represented by the Phœnician alphabet, is that which was common among the Egyptians at a very early date, for it had a hemispherical roof and straight walls. All early houses were constructed out

The cut on the preceding page represents the story of Creation under the figure of an arch, which is followed by a picture of the Creator and the divisions of the land and sky, the creation of the sun, moon and stars; afterward the creation of man and woman. An evil Manitou appears under the figure of a serpent. The first pair are at first happy, but the serpent tempts them and brings a great flood. Finally, Manabozho, the strong white one, appears and brings deliverance; the water ran off the earth, the lakes were at rest, all was silent, and the mighty snake departed. See "Red Stone," by D. G. Brinton.

of bent poles, or of adobe, but the houses of the Babylonians were constructed of sun-dried brick, and with walls of immense thickness.

IV. We are not confined, however, to mere tradition or mythology for our proof that the first home of the human race was in this traditional spot, for it is written on the very sky itself. It is noticeable that the map of the heavens was familiar to the nations of the East, and this map in itself conveys facts and truths which correspond to the traditions. The Greeks recognized Hercules strangling the serpents; the giant Bootes, with his club; Draco, the dragon; Cygnus, the swan, as well as the Great Bear and Little Bear. The Egyptians recognized the crocodile and the hippopotamus; also Horus strangling the crocodile, and the constellation of the thigh, as well as that of the lion. These constellations were known to all the tribes of the North, and it was a common custom for the people scattered over Europe, Asia and Africa to recognize the same strange figures in the sky. Mr. Norman Lockyer has written of this, and has from it made an argument in favor of the extreme antiquity of the pyramids of Egypt. The stars in Draco were circumpolar about 5000 B. C., but at 2000 B. C. the stars were in Ursa Major, and this accounts for the difference between the Egyptian and the ordinary constellations. The Star map, representing the precessional movement of the celestial pole from 4000 B. C. to 2000 B. C., is given in his work on the "Dawn of Astronomy."

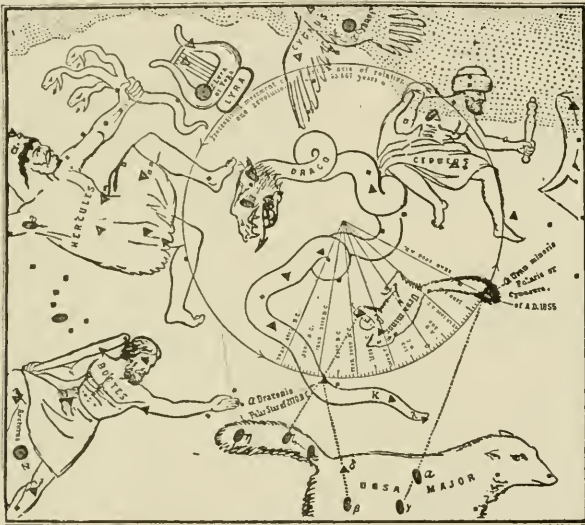
It is a remarkable fact that the North American Indians recognize the constellation of the Bear, and they have a story connected with it, which corresponds to their own habits of life. They do not recognize the great Serpent in the sky, and yet they do recognize the revolution of the Bear around a point in the sky, and make much of this fact. They also recognize the Pleiades, and regulate their feasts and religious ceremonies by its position in the sky. We may conclude, then, that even the people who settled this continent, and who have no knowledge of any other continent and no memory of events which are so familiar to us all, through our knowledge of the scriptures and our familiarity with the ancient traditions, were in reality emigrants from the far East and had their first home in the same place that our ancestors had.

There is another argument furnished by the geography of the heavens. It appears that in the northern sky the constellations represent objects which are familiar to the savages, viz.: the bear and the serpent, but those in the equatorial belt, objects which are familiar to civilized people, the lyre, the chair, the bull and the sickle. The only exception is that Hercules, Bootes and the harp appear in the northern sky. This would indicate that the races separated before the constellations were known.

Mr. Norman Lockyer says: "In all countries—India, China,

Babylonia and Egypt—they use the girdle of the stars to represent the stations through which the sun passed in his course, but this was after astronomy had become familiar to the people. Babylonia being the first or earliest place where the stars were studied. In Egypt the constellations embraced such figures as the crocodile, the hippopotamus and the lion, all of which were wild animals; but they represent boats as sailing over the sky, thus indicating that civilization dawned there at an early date."

No such constellations were known to the natives of America, and would not have been understood, if they were known. On the contrary, the very constellations which are familiar to all have a story connected with them, which is sug-



CONSTELLATIONS IN THE NORTHERN SKY.

gestive of the hunter life which prevailed on this continent. The Indians recognize the figure of a bear, but do not recognize the figure of the Dipper, or the handle of the Dipper; but, on the other hand, they see a little cluster of stars which represents a kettle, and the story is that a little boy attended the hunter, with a kettle in his hand, expecting that the chase would be successful.

V. The history of the East is very suggestive of the early condition of mankind, as well as of the first starting point. It has been an impression with many that history began with civilization highly developed at the start. It is, however, an impression that is not sustained by scripture, or by science. The picture given by the first five chapters of Genesis is one of pristine innocence. The Garden of Eden was the

abode of the first pair, who dwelt at ease, amid the beauties of Nature, and had every want supplied with labor and without care. It is the same picture which is given by poetry, and reminds us of the Arcadia of the poets. The picture externally corresponds to the scenes which abounded in the valley of the Tigris. The streams surrounding the garden, the trees within it, and the mild climate and abundance of fruit and vegetation which formally prevailed in this region, made it a paradise.

The growth of cities and extension of empire developed the resources of the country, but increased the labor and trials of people, as despotism took the place of liberty, liberty, which was the natural inheritance of mankind. The digging of canals and the use of irrigation developed the resources of the country, but increased the toils of the common people, and made the difference between the poor and the rich, the ruled and the rulers, very marked. There was the same sentiment, which afterward prevailed in Peru, and to a certain extent in Central America, that the rulers were of divine offspring, and so were entitled to their power and distinction, though when the people came under the influence of idolatry and the training of the priests, there grew a submission which ultimately became very abject servitude.

It was the influence of religion which led the people to erect their great pyramids and place the Shrine to the Sun Divinity on the summit, and to give power to the priests and to the kings to erect their great palaces, and to dwell apart from the people. It was exactly the same condition which prevailed on this continent at the time of its discovery. The cities became very numerous, and all of them were marked by pyramids and by palaces, many of them surrounded by high walls and wide gates leading in every direction. The evidence is that irrigation was practised, and the entire valley of the Tigris was filled with a teeming population, but all divided into tetrarchies.

The four cities mentioned by the scriptures, are Babel, Erech, Accad, and Calneh. Two of these, namely, Erech and Calneh have been identified with the ruins of Warkur and Nippur. Mugheir has been identified as Ur, which was the birth-place of Abraham. It was the southern most of all the great cities, and was originally a sea port. Like its three sisters, it was the great seat of that form of idolatry which marks the Chaldean period; the moon being worshipped at Ur; the sun at Ellasar, and Bel, or Beltis, at Calneh and Erech, as we learn from the ruined temples. Of the northern tetrapolis, the ruins have been discovered in the mound of Birs Nimrud of Sippara, at Nippur. The pyramids which are found in this region, are signs that idolatry prevailed, for the great Chaldean towers were temples devoted to the sun, moon and the heavenly bodies. The number of stories at Borsippa was seven, corre-

sponding to the sun, moon, and five planets. They were distinguished by different colors. The first, black; the second, orange; the third, red; the fourth, golden; the fifth, yellow; the sixth, blue; the seventh, silver.

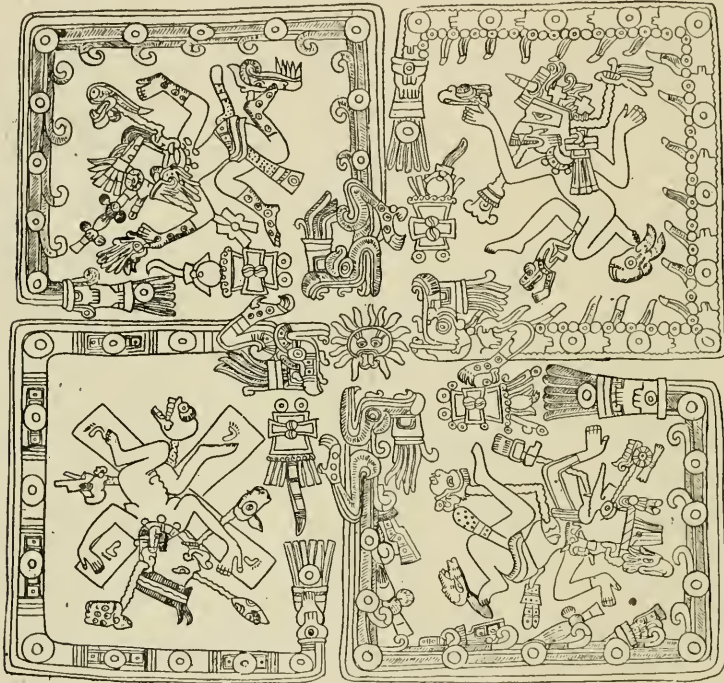
What stages of architecture preceded these great cities is now unknown, still the probability is that there was a growth before the days of the Flood, which enabled the survivors to begin where the Antidiluvians left off, for there are pictures of huts on the rocks clustered together, showing that the common people were still retaining the primitive habits and modes of life, after the ruling classes had reached such a high degree of power.

VI. The chronological system also proves the same point. Among the ancient races there were two or three different methods of dividing the year. One of these was apparently adopted by the hunter tribes; another, by the agriculturists, and a third by those who dwelt in cities, and who erected the temples and pyramids, each one having a different system of astronomy, or rather, astrology. In the primitive or prehistoric age, the polar star, or the north star, was the center around which the heavenly bodies revolved, and it was supposed to be the dwelling place of the creating power. It was at this time that cities were built up in the valley of the Tigris and the Nile and nations began to appear in China, in India, in Arabia, in North Africa on the borders of the Euxine, in the islands of the Mediterranean, and as far away as the North Sea.

There were also cities in America, and tribes in Central America, and tribes scattered through the interior of the continent, each one of which had a calendar system which was best suited to its own purposes. The study of comparative chronology has not gone far enough for us to draw any final conclusions, but we may say this, that there was no unity among the nations, for each nation had priests, or medicine men, who were learned in the science of astrology, and who gave direction to the religious ceremonies of the people; even controlled the employments, and laid out the cities according to the system which had been adopted; that the pyramids and temples were oriented toward the different points, and the whole arrangement of the buildings, and even the ornamentation of the buildings, were subservient to the calendar system. What is more, each nation and tribe had a special number, which was sacred. The Babylonians taking No. 7; the Chinese, No. 9; the North American Indians, No. 4; the Zunis and the Pueblo tribes, Nos. 13, 7 and 6; the Central Americans, Nos. 4, 5, 13 and 20. The study of these different numbers and the systems connected with them is very suggestive, for it throws great light upon the architecture which arose, and upon the religious customs which prevailed.

It appears that all the ancient cities, many of which are in ruins at the present time, were laid out according to a system,

which involved the study of the heavens, as well as of the earth, and the temples were generally the center of the city, the palaces were near the temples. The number of the cities which were grouped together was the result of the religious system. This furnishes an explanation of the tetrarchy which prevailed in Babylonia, and of the orientation of the pyramids there. It furnishes an explanation of the pyramids of Egypt, and especially of the orientation of the temples there. Many of them were used almost as telescopes to catch the rays of the sun at its rising at the time of the solstices, very much as



THE CALENDAR OF THE MAYAS.

the ancient temple of Stonehenge was. We may say also that the ancient cities of America were arranged according to the calendar system. The temple was the chief and central object, and all the roads led to it.

A theory has been advanced by Mr. F. W. Hewitt in reference to the temples in Central America and the calendar sys-

* The cut represents the four serpents which guarded the sacred year, each serpent being marked by thirteen rings, to symbolize the months. The figures inside of the squares symbolizing the activities of the seasons, and other figures representing the various symbols of the days, the whole making fifty-two years, which was a sacred cycle, the face of the sun in center symbolizing the great Divinity. There is, certainly, no chart or series of symbols, either in India or China, or any other part of the world, resembling it, and yet the idea may have been borrowed from the East.

tem which prevailed there, to the effect that it embodied the same system which existed in India; as the division of the year into thirteen months, which were composed of four weeks of five days each, was exactly the same as that which prevailed in India. This is exceedingly doubtful, still it is suggestive, and may lead to a further study of the ruined cities of both India and America.

One thing we are to notice, viz.: that the serpent symbol embodied the calendar system, for the four serpents arranged around the face and divided into thirteen parts, symbolized the months and days of the year. The calendar stone was so full of symbols, that it became a study for the priests, for all the employments of the people were directed by it.

The sacred year consisted of thirteen months of twenty days each, the months being divided into four weeks of five days each; the secular year of eighteen months of twenty days. Now, it is remarkable that there are symbols or pictographs of trees and serpents and many other objects, which plainly represent the calendar system, and these remind us very much of symbols which prevailed in the far East. Mr. F. W. Hewitt maintains that these symbols were derived from the Hindus, and contain many of the figures and symbols which are common in India, and claims that the Hindu year was divided into months and weeks of the same length as in America, thirteen months forming the calendar year, each divided into four weeks of five days each. The linear measure was derived from the counting of the fingers on the hands, and the length of the hand, fingers and arms, a system which prevailed also in America.

VII. The growth of architecture in the Stone Age is worthy of study in this connection. It has been found that the Stone Age prevailed in Egypt, but that it was marked by the graves of a very rude people, who buried their dead in a circular pit which they surrounded by pottery vessels, but a new age was introduced by a race which erected their tombs in the shape of a house, and called it a "Mastabah." The pyramids were really nothing more or less than a great series of Mastabahs. In Greece there was a Stone Age which continued almost up to the time of Homer. During this age the form of structure of the house was that of a cone, and the form was perpetuated in the tomb of the Mycænian kings. It is noticeable that in all other lands the same form of the hut marked the Stone Age, and was preserved in the tombs of the kings. It is by this means that we may trace the growth of architecture from its early beginnings.

It is remarkable that this kind of conical hut can be put together with the hands without any tools, and without any other support than is secured by the walls, which come together at a point. This is in itself an evidence that the various civilized races grew up out of a rude and primitive condition. It

was by the improvement of tools and the advancement of civilization that the change came, when the nations began to build perpendicular walls, and place upon the top of them timber which should serve as a support for the roof, though the form of the roof might vary according to locality, climate and other circumstances. In a climate like that of Egypt, the roof was likely to be flat. In a climate like that of Greece, with a peak at the top and a projection at the bottom, and held together by its own weight. The next stage would be to place a cornice on the eaves, and an entablature at the front. There was, however, no new mechanical principle involved. The material might vary, the walls might be made of adobe or sun-dried brick, but it was because they were built upright, that they served as supports to the roof.

There came, however, ultimately a new principle, for there was the use of the pier and lintel in making the doorway, or opening in the wall. There came also the use of the column in



CYCLOPÆAN WALL AT ATHENS.

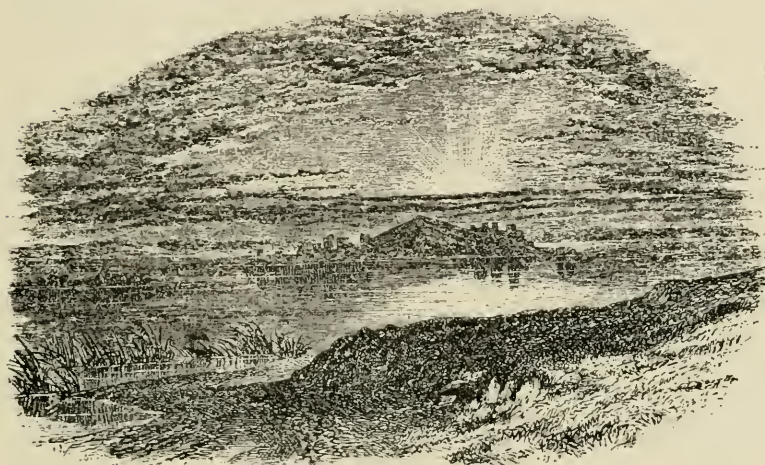
supporting the roof, and the use of the arch in supporting the heavy weight which might be produced by the size of the buildings and by the change of material.

Now, the fact that in Babylonia we find the earliest buildings, which are constructed after the pattern of a modern house, with upright walls and openings in the walls, and large rooms within, covered with roofs, and columns to support the roofs, and arches to support the weight, shows that the starting point of architecture was in reality in this very region, which is described as the home of the earliest civilization. We may take a sweep of all the countries surrounding this center, and we shall not find any place where architecture dates back to an earlier period. On the other hand, we find the ruined cities everywhere presenting the same general principles.

Schliemann discovered at Hissarlik a succession of cities; F. W. Bliss found at Lachish a similar succession; Hilprecht found at Nippur that it was a mound made up of many cities; Arthur Evans found the same evidence of a succession of population, and a number of cities built upon the ruins of one another; but in all cases there seemed to have been certain elements introduced from some other source. So far as has been ascertained the starting point was from the valley of the Tigris. There were, to be sure, at Athens cyclopean walls, which are

not found in the valley of the Tigris. There was a number of walls constructed from burned brick and from stone at Troy.

But in each one of these layers of the mounds we may read the history of many cities which lie in ruins, and think of the succession of people which appeared in this region; yet if we go in either direction from these centers, we soon come to those rude stone monuments which remind us of what the condition of society once was in these distant localities. The same lesson is taught us in our own country, for we need only to go from the great centers to the frontier to find architecture in its primitive stage. But when we go back to the first home of mankind in the valley of the Tigris, and examine the cities which have been brought to light from the depths of the great mounds which have so long remained silent, and find the evi-



VIEW OF THE BABYLONIAN PLAIN.

dence of writing in the libraries which have been opened to view, we are astonished at the record and are convinced that the starting point is just where tradition and scripture have placed it.

These facts show that the earliest home of civilization was in the southern part of the Asiatic continent and near the mouth of the Tigris, a region which is surrounded on all sides by mountains, but was connected by seas and rivers with other parts of the world. Civilization appeared first among the Accadians and the Semitics, and some hold that there was a third race, called the Mineans, in the Arabian desert. The contest which occurred between the Accadians and Semitics at the Tower of Babel, led the first-mentioned to take their departure, and they migrated northward and established what proved to be the Chinese civilization on the rivers which flow into the Pacific.

There was, to be sure, a race in Africa which grew up into a high grade of civilization, and established a great empire on the banks of the Nile, which was entirely different from the Babylonian, and in contrast with the preceding race, whose graves have been recently found; the mountains of Arabia upon the one side protecting them from the attacks of the wild tribes, and the deserts of Africa also protecting them on the other side. There arose, however, a race which belonged to the Semitic stock, who became the navigators and traders of the world, namely, the Phœnicians. They never originated a civilization of their own, but they transmitted it from the east to the west. They, as Mr. A. H. Keane has shown in his remarkable book called "The Land of Ophir," sailed along the coast of Asia, up the gulf of Suez, and finally reached the Mediterranean. It is supposed by some that they opened the mines which have been so recently discovered in Mashonaland and Rhodesia, and established trading stations on the east coast of the Gulf of Suez. This can be said, at least, a Himyaritic settlement was established in southern Arabia long before the days of the Queen of Sheba. Mr. Keane thinks that the Phœnicians gave their art to Crete and Cyprus, and that this served as the beginning of the Mycænian civilization.

The same point is illustrated by the history of civilization everywhere. It was not because certain nations had power to overcome all obstacles, and by their own unaided efforts were able to rise to a high condition, but because their situation was favorable, and especially because the effects of civilization, which had arisen elsewhere, were transmitted to them. Such, at least, was the case with all the civilized nations of the Old World. And we see no reason for making the civilized nations of the New World an exception, even if the evidence of transmission has not as yet been given.

The conclusion which we reach from the study of these various facts, is that the earliest home of the human race was in the very place where tradition and the scriptures have shown it to have been, but it was owing to the separation of the tribes and nations of the earth at a very early date, and through migrations from this very spot, that the world was peopled. What effect this fact may have upon the opinion which may be formed in reference to the first peopling of this continent and the rise of civilization here, will depend upon the preconceived theories; yet the fact that there are so many resemblances between the customs, traditions, habits and styles which prevailed in the far East, and especially in the ruined cities discovered there, and those which are to be found here, cannot fail to give interest to this study.

CHAPTER IV.

THE BEGINNINGS OF ARCHITECTURE.

We have spoken in a previous chapter of the earliest home of the human race, and have shown that it was in the valley of the Tigris and Euphrates, the very localities spoken of in the Scriptures and referred to in the traditions prevalent in the East. We are to devote this chapter to the study of the beginnings of architecture, but shall go back to this very locality for illustrations of the subject.

It is a remarkable fact that the earliest mention of structures of any kind, is that which concerns the tree, the gateway, the altar and the city, all of which are mentioned in the story of the Garden of Eden. It may, indeed, seem to be a mere assumption when we say that these form the elements which appeared in the earliest architecture of the world, but such is the opinion of the best writers upon the subject, and it has been confirmed by many recent discoveries. It was formerly the opinion that the cave was the earliest abode of man, and that the rude hut took its place, and following this was the house, with its doorways and walls and roof; but as we go back to the earliest days we find that primitive man lived in a warm climate, and dwelt among the trees and found food and shelter from the objects of Nature, and only as he wandered from his first home did he find it necessary to resort to caves. The date of his departure from this traditional locality is somewhat uncertain, but recent discoveries have carried back the beginnings of civilization so early, that many have concluded the historic period here preceded the prehistoric elsewhere, and that men were building cities in the central region, while they were dwelling in caves in other and distant localities. This does not prove there was no Stone Age in this region, but, on the contrary, it carries back the date of the age indefinitely, and makes us to realize something as to the antiquity of man upon the earth.

In reference to the earliest condition of man in this locality, we have no actual information, except that which comes to us through tradition; but judging from the nature of the soil, and the character of the climate, and the resources of the country, we may conclude that here man first abandoned the wild state, came into the practice of agriculture, and began the custom of erecting villages, which ultimately grew into cities, and became thoroughly civilized. Such is the opinion of those who have visited the region and have noticed the wonderful fertility of the soil and the ease with which it was irrigated, and the evi-

dence of a numerous population, which once inhabited the region; making it worthy of the name of "Paradise," though at present desolation reigns supreme. The same opinion is expressed by those who have studied the ruins of the various cities which once stood beside the banks of these historic rivers, for they find that there has been a succession of races and peoples for many thousands of years.

What the earliest structures were remains somewhat uncertain, but it seems that man, even in the state of nature, was endowed with certain qualities which enabled him to understand and to use the mechanical principles, for this progress is manifest in the various structures which embody these principles, the earliest specimens of which were probably erected in the valley of the Tigris.

These may have been made out of wood, resembling those which are still occupied by people in various parts



PRIMITIVE HOUSES IN TROPICAL LANDS.*

of the world, of which illustrations are given in the cut. The rude huts, which were the primitive habitations of man, became more pretentious, and these were followed by the great cities which are mentioned in history. The same mechanical principles were found in the city that were embodied in the house, for every city had a wall corresponding to the wall of the house, a gateway corresponding to the doorway of the house, and a temple corresponding to the hearth in a house.

The house may have been a mere hut made of poles, reeds,

* This cut represents the huts which are still common amid the tropical forests of the South Sea Islands. The huts which were built on the plains of Babylonia resembled them in some respects, but were made from wattle-work, covered with clay, and had peaked roofs. Pictures of these may be seen cut into the rocks of the region.

wattle-work or mud, but it must necessarily have a wall and a door, or an opening of some kind, and generally would have a hearth in the center. The village would, also, naturally have a wall of some kind surrounding it, and a gateway at its entrance. It matters not whether the walls were composed of timber stockades, or of stone; the gateway a mere opening in the wall, or constituting a lofty portal, the same elements appear in the village as are found in the house. The city always must present the same features: the wall of the city being only a repetition of that of the house and village; the gateway that led into the city was the repetition of the doorway that led into the house; the altar, which was the center of the city, was only the reproduction of the hearth, which was the center of the household, and the temple was only the outgrowth of the altar. The king, or chief, who ruled over the city, was only the representative of the father of the household. The divinity, which was worshipped in the temple, was the divinity of the hearth, with his character changed and his dominion enlarged; the religion of the household being transferred to the temple. This correlation is very important, for it was from the domestic and religious life that architecture grew, and it was this which ruled throughout all the earliest stages of its progress.

There are, to be sure, some who hold that the rude stone monuments, which are scattered over the globe, actually preceded all of these structures which have been referred to in history, and that the dolmens, the standing stones, the menhirs and the triliths, and the earth circles, were the elements out of which all architecture was developed; and it was in the open-air temple that religion made its first home. But we may conclude that these were only modifications which were adopted by a rude people, who dwelt in the forest and who, as the children of nature, disliked the restraints of the city and the customs of organized society, and they only show a parallel development, and prove nothing in reference to the early stages of architecture. It is to be acknowledged that these were all consecrated to the worship of nature divinities, and were connected with the sun worship; but they contain the same elements which were incorporated in the house, and afterward in the city. The dolmen, which was used as a burying place, was patterned after the house—the earth wall represented the wall of the city, the trilith represented the door, the altar stone represented the hearth, the standing stone represented the column; the only element lacking to make a perfect structure, was the roof.

These facts only illustrate the point which we have made, for the structures which appeared in the prehistoric and the early historic periods were all connected with the "beginnings of architecture," and were the embodiment of it, under diverse forms. They also show that all nations, whether situa-

ted in Europe, Asia, Africa, or America, passed through about the same stages of progress, and erected the same class of structures; making walls which were similar wherever they appeared; also, gateways, columns, and even cornices, which resemble one another, the chief difference being in the style of ornamentation and the finish of the different parts.

I. This is the point which we design to illustrate, and shall begin with the description of the wall.

Tradition carries us back to the walls made of osiers, and to the conical roof of the early dwellings, but the walls of the first cities were generally built of masses of clay, supported by abutments; or of rough stone, partially trimmed, called cyclopæan walls; or of polygonal stones; or of stones placed in layers—the progress of society being represented by each style of wall. Various specimens of these walls may be seen



EARLIEST STYLE OF WALL

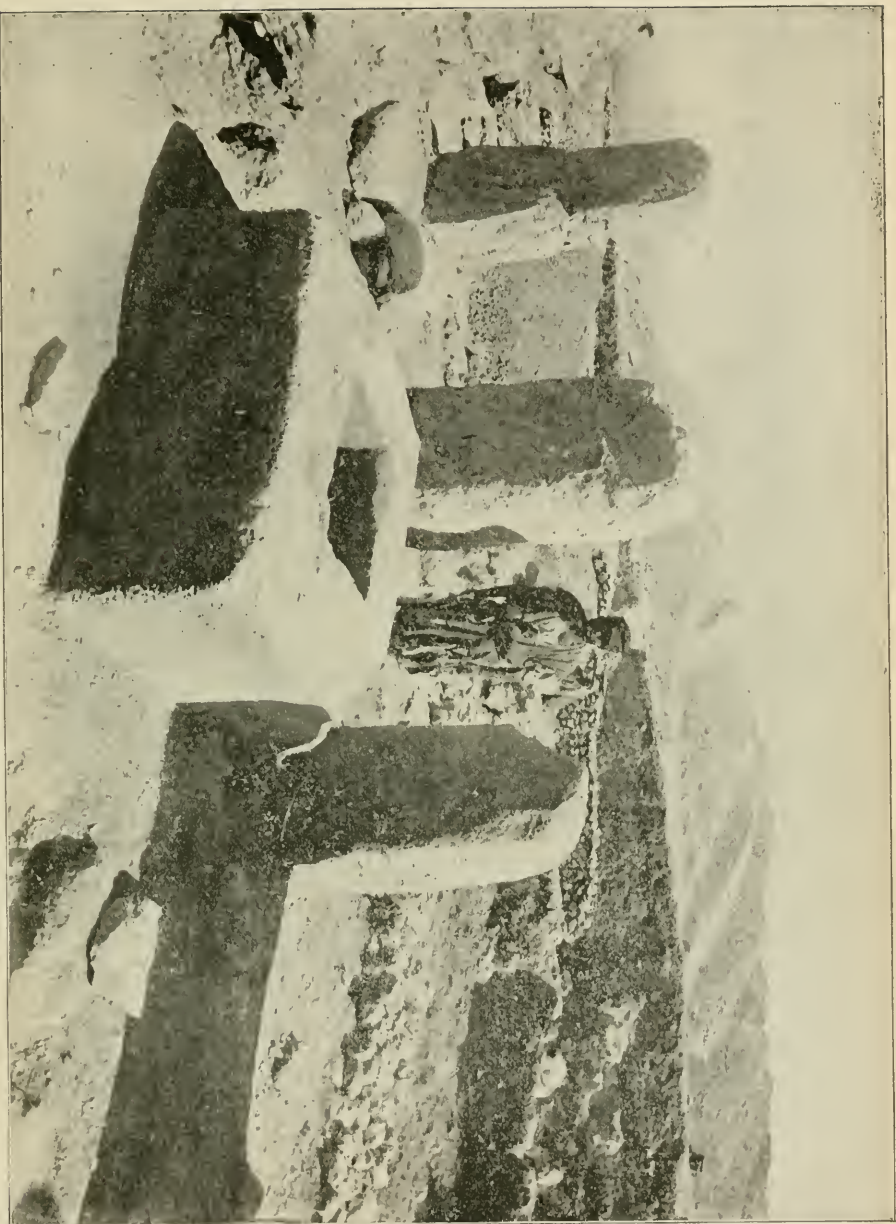
of Jerusalem, the very shape of the stones, and the construction of the walls, furnishing the means by which the history of the city and the temple can be read.

Recent explorations at the ancient Gaza have brought to light a remarkable structure. This megalithic structure is exhibited in the plate. It consists of eight pillars, three of them still standing, and an altar, or a socket, used for holding the "Asherah," or symbol of worship. Mr. Masterman says:

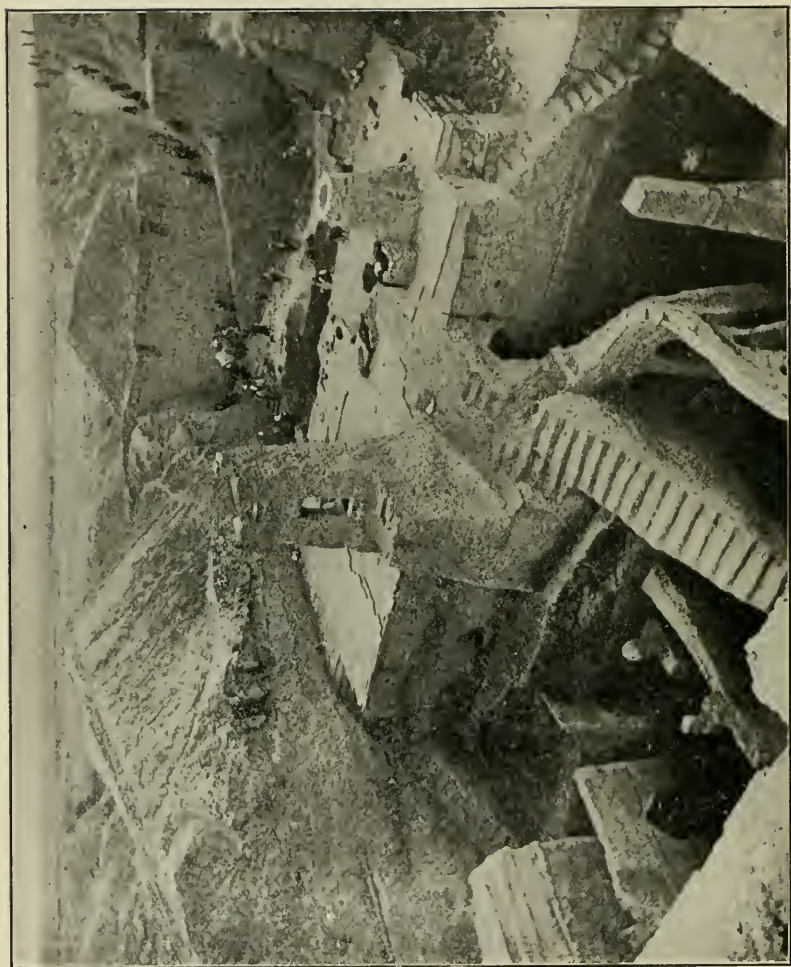
We have the remains of at least seven periods of occupation. Beginning with the caves in which flint knives and a primitive kind of pottery was found, we come next to the period of the earliest city builders, or temple builders, who have surrounded their large enclosure with a city wall, consisting of an earth bank faced with stone. We next find a circle of standing stones resembling those found at Stonehenge in Great Britain. We afterwards find the great Baal Temple, which belonged to the period of the Bronze Age; after this, the historic period.

At first the size of the stones was regarded as an index of a nation's grandeur, and everywhere we find the great cyclopæan walls, which were put together by the brute strength of the people, who were gathered in masses and ruled by one

in the cuts; one of which represents the cyclopæan walls and the Lion Gateway, which were in front of the Bee-Hive tomb of the Mycenæan kings; another, represents the different styles of walls which have been found in the city of Jerusalem; the third represents the wall with abutments, which surrounded the temple



EXCAVATED REMAINS OF THE ANCIENT TEMPLE AT GEZER.



EXCAVATIONS IN THE TEMPLE COURT SHOWING PAVEMENT OF UR-GUR.

mind, but afterward the stones which involved more mechanical skill and showed a higher finish, were placed in the walls. The same thing is true of the house and the temple—size, rather than finish, was the standard of excellence.

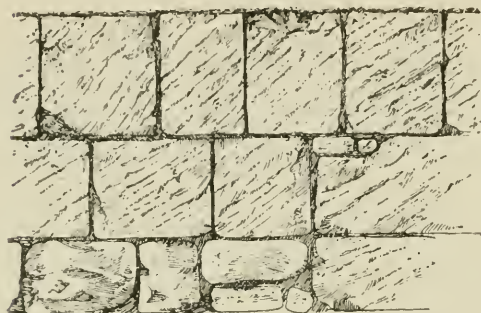
In Babylonia the first or earliest buildings which have been discovered were made of sun-burned brick, but were made up of walls of immense thickness, and contained drains, some of which were arched. The mechanical skill required to construct these walls and the drains was far beyond that which was exercised in the Stone Age. The testimony of all the explorers is to the same effect. Their dates may have been exaggerated, but the facts remain the same. The cities of Babylonia show that a fair degree of civilization had been reached.

With clay as a building material, so readily moulded into any desired shape and capable of being baked by the action of the sun, without the use of fire, it was almost as easy to build a large house as a small one, by the addition of rooms and wings, and stories, which differentiated the house from the palace, and the palace from the temple, and served to make hugeness the index of grandeur. The best specimens of architecture of Babylonia and Assyria, as well as Egypt, were characterized by such hugeness, but without any external beauty.

The cyclopæan masonry was used in the Argive fortresses, as well as the gateways of Mycenæ, and was earlier than the well-dressed blocks so common at Troy, but it is supposed that the massive clay walls discovered by the American explorers at Nippur were much earlier, for they date back as far as 4500 B. C., which was anterior to the building of the pyramids. The American explorers also found pavements at Nippur, which dated back to pre Sargonic times; one of which was called the pavement of Naram Sin. It was situated about six or eight feet above the present level of the desert. Mr. Haynes penetrated through more than thirty feet of ruins before he reached the virgin soil, and thirty-five feet before he was at the water level. But at this lower level there were the human remains, which showed that man had existed in a rude state before this great city, whose ruins rise so high above the desert, had begun to be built. It is supposed, by Mr. Haynes, to be the ancient place where sacrificial victims were burned; but by Professor Hilprecht was supposed to mark the site of a prehistoric grave, which was dug during the Stone Age.

Prof. Hilprecht says that twenty-one strata of historical periods are represented by the ruins of Nippur. In the earliest Sumerian stratum we recognize six phases of historical development, by the remains of the different kinds of brick employed and by the size of the brick; six periods are determined by fragments of baked and unbaked bricks in the temple court. The walls of the early period were of immense thickness, and were

made of unburned clay, but columns were not used until quite late in history. In fact, it is supposed by Prof. Hilprecht that there were libraries in Babylonia before columns were built. Gateways, with inscribed sockets, were used before there were



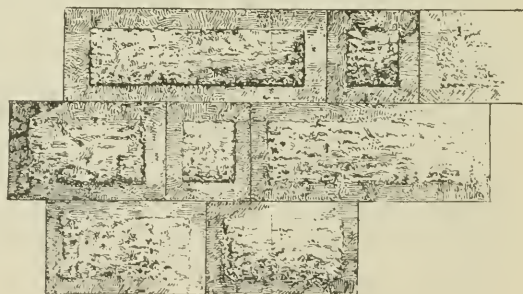
QUARRY-DRESSED STONES.

columns. Ziggurats, or towers, were built before the column came into use. An arch, made out of brick, with wedge-shaped joints, and made out of simple clay, was discovered. It was built to support a vaulted tunnel, which was used for the draining of the foundations of the palace and the

temple; the preservation of the arch for six thousand years showing the same mechanical strength and skill that built it.

The religious instincts of the people, to be sure, for a long time discouraged any deviation from the original shapes. The sacredness of the house, led to the perpetuity of its shape in the tomb, and the sacredness of both gave a conventional shape to the temple. The conception of the universe was that of a great house, whose dome spanned the sky, and was peopled by the divinities, above, and by man below.

In Egypt, also, graves have been found which antedated the days of the pyramids by several thousand years. These graves show that the habitation which was occupied, was a circular hut, and that the people were in the Stone Age, but were acquainted with the use of pottery, and were accustomed to bury their dead in the form of a circular grave, and deposit pottery vessels along with them.



ROUGH BOSSES AND COMB MARGINS.

The history of the city of Jerusalem is written in its walls and in the stones lying beneath the surface. But before the city was occupied by the Israelites there was on the same spot, the walled town which was built by the Canaanites, and was, perhaps, overthrown by the Hittites.

These possibly may have been in existence when Abraham was following his flocks.

The excavations at Jerusalem, conducted afterward by Mr. Bliss, revealed a series of walls and gateways, which proved a succession of cities even at Jerusalem. The stones in the wall show various styles of masonry and several periods of rebuilding. The lowest course show rough foundation work; above it, quarry-dressed and roughly-squared; the third, straight joints; the fourth, chisel-picked centers and combed-margins; another, rough bosses and comb-picked margins. Great towers were found, with massive walls; also rock-hewn chambers and door-sills, which had been worn by the feet of those who passed over them. A succession of these, one above the other, showed the passage of time. Mr. F. J. Bliss says: "The hint is



WALL WITH ABUTMENTS AT JERUSALEM.

furnished by the fortifications, that the first city was built to resist the great conquerors of the Egyptian dynasty, beginning with Thothmes I. It is possible, however, that they may have been built earlier as a protection against local foes."*

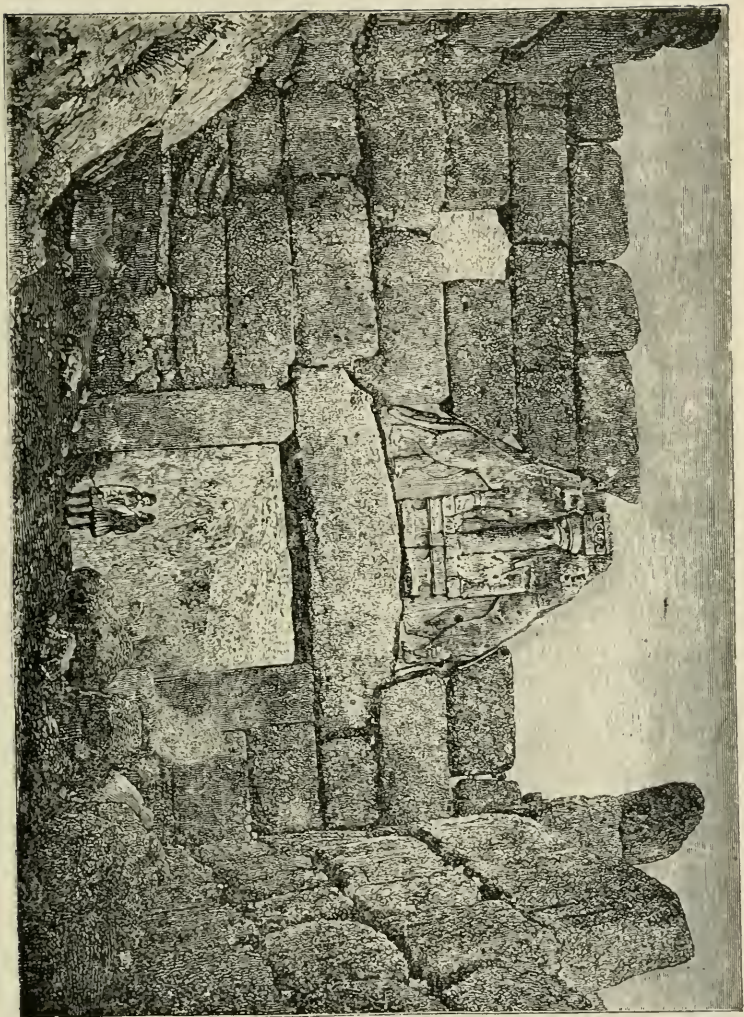
II. We turn to the gateway. This is a very important element in the history of architecture, for it carries us back to the earliest times, when men dwelt in huts, and brings us on to the time when they dwelt in great cities, whose walls secured a defense, and entrance to which was thoroughly guarded.

We give a picture of the gateway at Mycenæ, which represents the different kinds of walls, the earliest form of the arch, the earliest form of the column, and the earliest form of the hut or house; all in close proximity, and all suggestive of the

* *Mounds of Many Cities*, p. 137.

traditions of the past, but full of promise for the future. This gateway brings to light that stage of civilization which prevailed during the Mycenæan Age, and shows us the gradual development of architecture through all ages. We see in the walls that guarded the entrance to the gateway, the different forms and styles of dressing the stone: the rough course of masonry represents the cyclopæan period; the polygonal stones represent the second period; the stones with rough bosses projecting, the third period.

The same forms of masonry have been found by Mr. F. J. Bliss in the walls of Jerusalem. Besides these, he found both quarry-dressed and chisel-picked stone, making a fourth and fifth period. The gateways at Jerusalem show several distinct periods, by super-induced sills with door sockets. The width of the gate varies, with the different periods, but the smooth-faced masonry continued through four gate periods. The abutments and gate-towers are important in connection with the history of architecture. In the earliest period, there were no abutments and no columns, but at a later period abutments appeared in Babylonia, in Jerusalem, at Damascus, and at Troy. But the plain wall, with its different kinds of stone cutting or trimming, is a better index of age or period, than the abutment. Great catastrophies came upon the different cities of the east, and changed them into immense heaps, from which there stood forth only the great thick walls and the terraces of the temples. But it is difficult to determine the age, from the ruins and *debris* of the temples; so that when we find a gateway like that at Mycenæ, we can read the record more readily and correctly, than we can that which is presented by different layers of earth, or the different kinds of buildings. There were gateways at Babylonia belonging to different periods, some of which were guarded by lion-headed figures; others, by the figures of immense bulls, and by human figures, with eagle heads, showing that the religious symbols were incorporated into the architecture at a very early date. There were also great gateways in front of the temples of Egypt, but in front of the gateways there were long, parallel lines of sphinxes, arranged in double rows, which guarded the approach to the temple, and imparted a sense of awe and fear to all who approached the temple. The gateway itself was of a more imposing height than the temple, in front of which it stood, but it was built after the same general style, with its walls drawing in towards the top, and an immense cornice, or coping, projecting beyond the wall; while the common religious symbol, of the winged globe, was a conspicuous figure in front of the wall and above the entrance to the gateway. There were obelisks in Egypt, which were placed in front of the temple, and which were, perhaps, the earliest form of the column; but were the survivals from the prehistoric period, and are supposed to be connected with sun-worship.



LION GATEWAY AT MYCENAE.

This Gateway at Mycenae is a most remarkable structure. It is approached by a roadway 50 feet long and 28 feet wide. The Gateway itself is 10 feet 4 inches high and 9 feet wide. It contains an immense lintel, 16 1/2 feet long, 8 feet broad, and 3 1/2 feet thick, formed by heavy stones overlapping one another, until they meet 10 feet above the lintel. The space is filled by a slab on which is sculptured the column and the two lions which guard the gateway and the tomb.



OBELISK OF THOTHMES AT KARNAK.

Obelisks are supposed to be the survivals of the standing stones, which were so common in prehistoric times, and were always connected with the sun-worship which prevailed. These standing stones were connected with the open air temples, which were always circular in shape, and only presented a series of triliths, arranged in the form of a horseshoe, with the altar in the center; but the fact that there was a monolith, or standing stone in the gateway of this temple, and that it was so placed as to cast a shadow into the temple and toward the altar at the time of the rising of the sun, at the time of the solstice, suggests the thought that the obelisk was a survival of the same worship, and that the temple of Egypt was devoted to sun-worship. Of course there was a great contrast between the temples of Egypt and these circular enclosures, for they are surrounded by solid walls, which are decorated by figures of kings and priests, and are filled with stately columns finished in the highest style of Egyptian art. Yet these very temples were so arranged as to catch the rays of the sun as it rises at the solstice: The very innermost recesses of the temple being reached by the rays, which turned the temple into a gigantic telescope.

These elements, however, which were found in the different gateways of Babylonia, Assyria and Egypt, were concentrated into a small compass in the gateway of Mycenæ, for here we find different kinds of walls, representing different ages and styles of architecture on either side of the gateway, itself—the rude lintel, with a post above the lintel, a lion upon either side of the post, a rude form of triangular arch above the post, and behind the gateway we see the conical form of the "treasure house," which represents the primitive hut, and yet was the tomb of a king. The whole progress of architecture up to this time was concentrated into this one locality, but the promise and anticipation of its future is concentrated into the pillar, or post, above the gateway, for this is the earliest representative of the column.

III. This leads us to the column, and its connection with the tree. It was formerly the opinion that the column was the representation and the survival of the wooden post which supported the projecting roof of the primitive house, and so formed the portico to the house. This was a thought mentioned by Perrot and Chippiez, who have shown very clearly that the connecting links are to be found in the tombs of Midas in Phrygia and elsewhere, and assert they were transmitted from Persia to Asia Minor and Greece at an early period. But the opinion of Arthur Evans is that the column is the survival of the tree, which stood in the Garden of Eden, and was a symbol of the presence of the divinity. The standing stones and dolmens were also the survival of the tree.

The columns of Persia have capitals in the form of two-headed oxen, and pyramids in the form of dogs. The columns

of Egypt have capitals in the form of the lotus blossom—buds and blossoms. The columns of the Greeks have capitals in different shapes, each order of Greek architecture being indicated by the shape of the capital. The Doric capital was always in the form of a roundlet; the Ionic capital in the form of a scroll; the Cornithian in the form of an acanthus leaf; the Phœnician capital in the form of an animal's head. The American column was without a capital, but had a band about the middle, and served as an ornament in front of the palaces.

None of these decide the question as to whether the column was a development from the tree, and was a religious symbol or not; for some would take the ground that there was an independent origin of the column, and the tree, and the capital, in every country, and that each nation developed the capital and the column from its

own ideas, independently of every other nation. This is certainly true, that the column, with its capital, very fitly represents the habits and ideas of the people who have adopted it as the chief ornament in their architectural structures. The animal-headed capital of the Persians suggests that they had to do with cattle; the fluted column of the Egyptians, surmounted by the capital in the form of a lotus blossom, suggests the thought that the lotus was their sacred plant, and was a symbol of their religion. But the column of the Greeks, which was

so different from all others, represented the kingly power—the lion either side of the column, being symbols of strength and power. The position of the column over the gateway which led to the treasure houses of the king, seems to confirm this supposition. There was, however, no doubt, a religious element connected with the column and its capital, everywhere, for the column in its use throughout all ages and lands was more of an ornament than a support, and was never regarded as a mere mechanical contrivance, or a part of the structural development.

There were primitive settlements at Knossos, and a thickly populated region at a remote prehistoric period. This was



CARVED POSTS AND RAFTERS.

during the Stone Age. Dr. Arthur Evans says: "There was a transitional period, when copper came into use. At this time there were columns and streets, and pottery was in common use." At Crete excavations have brought to light a series of primitive houses containing pre-Mycenæan pottery, also evidences of "pillar worship." Dr. Evans lighted upon a prehistoric palace, which he connects with the name of Minos. One thousand inscribed tablets in script, partly hieroglyphic and partly alphabetic, were exhumed. A bridge and a road were discovered, connecting Knossos with other cities of great antiquity. There was a high artistic development at Knossos in prehistoric times. The existence in Crete of a prehistoric system of writing, is maintained. Pottery identical with that at Hissarlik was found in the early strata. Associated with celts, are perforated maces, obsidian knives, spindle whorls and bone implements. A transition period occurred when copper came into use. Pillars of Mycenæan form, sloping downward, narrower at the bottom than at the top, made of wood, were found; also a corridor, priestly forms wearing long robes, a central clay area, the survival of a prehistoric dwelling, were also discovered by Dr. Evans, who says:

Among the great monuments of the Mycenæan world hitherto made known, it is remarkable that so little is found with reference to religious beliefs. The great wealth of the tombs, the rich contents of the pit graves, the rock-cut chambers, the massive vaults of the bee-hive tombs, are all so many evidences of a highly developed cult of "departed spirits."

The pit altar of the Acropolis at Mycenæ was dedicated to the "cult of the ancestors of the household." In the central area of Knossos, however, there has been brought to light two rectangular altars, showing a special relation to the god of the "Double Axe." The colossal rock-hewn altar at the mouth of the Idæan cave revealed the same thing. Throughout Crete, a series of caves contain votive and sacrificial deposits. In the prehistoric city of Goulios, in Crete, we have the remains of a shrine containing a sacred tree; also a doorway showing the sanctity of the trilith as a ritual doorway. This doorway of the enclosure may have had before it, a sacred pillar; while within the sacred shrine was the tree itself, spreading its boughs over the low walls and lintel. Within this, was a rock-cut cistern, showing that a ritual watering of sacred trees was the regular feature of this form of worship.

In Mycenæ the tree is associated with the sacred pillar. The cult of trees and pillars of rude stones may be regarded as identical forms of worship, but illustrate the progress of architecture as connected with religion. The presence of a tree or bush indicated the possession of the material object by the "Numen" or divinity, exactly as sun worship will account for the rough pyramidal stone, often seen so close to the altar, and in reality would account for the obelisk being placed in front of the pyramid tomb. The cult of Mycenæan times consisted in the worship of sacred stones, pillars and trees. The whispering of the leaves of the trees at Dodonia, was the actual voice of the divinity. In the Druidical worship of the tree, the menhir was the symbol of the divinity; it was a survival of the tree.

The prehistoric stone fence at Rollright guarded the temple enclosure, but the king-stone, is the tree. The Diktean caves contained a stalactite in the shape of a tree. The sanctity of the portal and the doorway, in the primitive cult, is very general, and is associated with the sacred tree. The doorway, in a later architecture, like the dolmen, in Italy served as the dwelling place of the deity, making the threshold to be always regarded as sacred.

The Mycenæan column may have been derived from the tree, which was sacred; its downward tapering distinguishing the Greek from the Egyptian column. The Egyptian obelisk tapered from base to top, and resembled the menhir, while the earliest Greek column tapered from top to bottom, and resembled the tree with its branches.

There is no trace of shafts or capitals at Knossos, though the shape of the shafts or columns has the downward taper, after the Mycenæan style.

The most interesting feature of the column and gateway at Mycenæ, is that they not only represent the survival of all the earliest elements of architecture, but they also represent the earliest form of the arch. Here, the arch is only a triangular opening, above a lintel, the column resting upon the lintel, but supporting what might be called a substitute for the keystone, and all together serving to distribute the weight, the wall on the two sides, and the pier and lintel and the column, receiving the weight, and together bearing the strain. But the principle of the true arch is lacking.

This leads us to the subject of the arch. It was formerly the opinion that the earliest form of the arch was the triangle, the very one presented in this gateway. Recent explorations in Babylonia, have, however, brought to light an arch made of brick, which has the keystone, and so is a true arch; and Dr. Hilprecht claims that it was executed about 4000 B. C., and was built over an aqueduct or drain, but was fifteen feet below Naram Sin's pavement. This arch presents peculiarities which are of special interest, provided it was built at the time assigned to it. Dr. Hilprecht says:

It was constructed of well-baked brick, measuring 12 x 2½ inches, laid on the principle of radiating voussoirs. The curve of the arch was effected by wedge-shaped joints of simple clay mortar, used to cement the bricks. On the top of its crown, was a crushed terra-cotta pipe, intended to give exit to the rain water. It is supposed that the tunnel, which was used for a drain, was made to support all of the superincumbent mass, by this remarkable arch. The walls of the tunnel were built with remarkable care, the lower courses being placed flat-wise, while the upper courses were up and down, like the books on a shelf.

The lowest real brick structure was about thirty feet above the undisturbed soil; in other words, about the level of Naram Sin's pavement, in the temple mound. A corbelled arch of crude bricks, and a vaulted cellar of burned bricks, the latter about twelve by eight feet in length and breadth, were discovered somewhere at a low level in the same mounds. From general indications, I should ascribe them to about 2500 B. C. They give evidence to the fact that arches and vaults were by no means uncommon in ancient Nippur.

The city became an especial place of worship, the temple court provided with a solid pavement and high walls. It presented this character for over 3,000 years. Nine strata can be distinguished, more or less accurately, in the temple court. The *debris* constituting the different strata, representing nearly 3,500 years of history, and including the pavement of Naram Sin, measures only from seventeen to nineteen feet in the temple court.

CHAPTER V.

EARTH AND STONE CIRCLES.

Stone circles may be classed among the earliest and most primitive of architectural structures, though they have been ascribed to the latest of the prehistoric ages. They have been the objects of study by archæologists for many years, but have been and still are very mysterious, as their origin and use are unknown.

There have been various opinions advanced in reference to them, and many fanciful theories have been presented. The first theory which gained any extended support, was that they were erected by the Druids, and for a time they were called Druidical circles. This theory was adopted by the famous antiquarians Stukeley, Bryant, Aubrey and, Maurice, all of whom wrote extensively upon the symbolism which was contained in them. It was an interesting theory, as worship of ancient rude stones in consecrated groves and the sanguinary sacrifice of men and beasts has a strange fascination about it. Maurice says:

The Indo-Scythians performed their sanguinary sacrifices under groves of oak, of astonishing extent and of profoundest gloom. With the Scythians, a tall and stately tree with wide-spreading arms was the majestic emblem of God. Their perverted imaginations conceived the majesty and attributes to be best represented by gigantic sculpture and massive symbols. These grotesque and ponderous stones were placed in the centre of the most hallowed groves, and it is probable that they placed them, as we find them arranged in the Temple of Stonehenge, in a circular manner; the sun being the general object of ancient adoration, whose temples were always erected in a circular form, like those of the Persians at Persepolis. They were open at the top, for like them, the Scythians esteemed it impious to confine the deity, who pervades all nature, whose temple is earth and sky, within the narrow limits of a covered shrine, erected by mortal hands. A deity was supposed to reside amidst the solitary grandeur of those rugged misshapen rocks; superstition aided a disturbed imagination to give the airy phantom a form gigantic as his imagined temple; to adorn him with the symbols of vengeance and terror, and invest him with attributes and properties congenial with their awe and apprehension. Hence it arose, that, with this species of rock devotion, rites of a sombre and melancholy nature were perpetually blended, and that their altars were stained with such torrents of human as well as bestial blood.

It was a place of blood and horror, abounding with altars reeking with the gore of human victims, by which all the trunks of the lofty and eternal oaks, which compassed it, were dyed a crimson color; black and turbid waters rolled through it in many a winding stream; no soul ever entered the forlorn abode, except the priest, who, at noon and at midnight, with paleness on brow and tremor in his step, went thither to celebrate the horrible mysteries in honor of that terrific deity, whose aspect he yet dreaded more than death to behold.*

* "Indian Antiquities or Dissertations," by Maurice.

On May Eve, the Druids made prodigious fires on these cairns, which being every one in sight of some other, could not but afford a glorious show over the whole nation. The Druids on their great festivals wore on their garments or carried in their hands, a crescent of gold, silver or other metal. This ornament has long glittered on the banners of the East. It was when the moon was six days old that they marched in solemn procession together, and it was from that precise period that they began to count anew the months and years which formed the celebrated cycle of that duration. Their veneration of the astronomical symbol of the crescent may be also regarded as an additional proof that those crescent-like temples in Anglesea and Orkney, which some have mistaken for amphitheatres, were really temples to the moon.

This explanation by the old writers appealed to the imagination and was very popular, as popular as the theory that the mounds were built by the lost tribes of Israel, has been in America, and as difficult to supplant.

Later on, the subject was taken up again, and an explanation was given which went to the other extreme. The stone circles were regarded by some as quite modern. Some of them were built after the time of the Romans. This was the theory that Fergusson advanced. The interpretation given by Fergusson was that the circles were designed as burial places, and possibly marked the boundaries of ancient tumuli; the standing stones were the monuments which were erected on battlefields in memory of those who had fallen. He maintained that the alignments at Carnac, in France, marked the place of struggle on the battlefield, and the dolmens the burial places of the chiefs, and that the circles and standing stones belonged to the Roman period.

"The standing stones at Carnac represented the march; those at St. Basle, the position before the battle; those at Erdovan, the scene of the final struggle for the heights, and the tombs scattered over the plains and between the alignments, the graves of those who fell in battle. The date was between the overthrow of the Roman power by Maximus in 383 and the Sixth Century A. D."

Another explanation of Stonehenge was that given by Jeffrey of Monmouth, that it was erected by Merlin to commemorate those who fell, treacherously slain by Hengist in 462.

Fergusson objected to the theory that they were used as temples, and says:

What kind of a worship could be performed in them? Assuming a ceremony to take place in the centre of either of the circles; the double row of stones is so placed as to obstruct the view in any direction, no sanctuary, no altar, no procession path, no priests' house. In India, we have temples as big, but their history is written in their faces. There is a small shrine with a narrow enclosure and a small gateway, but for some cause it grows; a second enclosure is added to contain new accommodations for pilgrims and new halls and new residences for priests.

The description of the enclosures and circles, as given by Fergusson, is very valuable, but his explanation is not satisfactory. Recently, the archæologists have gone back to a modified

form of the old theory, that the stone circles were used for sun worship and that they were oriented. This is virtually the theory advanced by Mr. A. L. Lewis, who has compared them with the structures erected in Mashonaland. He has, also, in an article in the *American Antiquarian*, shown that there was always some peak in the neighborhood, or some massive stone or mound, outside of the circles, which caught the rays of the sun when rising, at the time of the solstices, and it may be inferred from this that the circles were used for special religious ceremonies at such times.

In reference to this, we may cite the testimony of Fergusson himself, who shows that many of the circles were attended with these prominent gnomons. 'Long Meg and Her Daughters' is situated a half mile from Penrith, and consist of 68 stones, 330 feet in diameter. Outside of the circle is 'Long Meg,' 12 feet high; on the inside are two cairns. Stanton Drew consists of one circle, 378 by 345 feet in diameter; the second is 129 feet in diameter; a third, 96 feet; attached to the circles are avenues, and a large stone called the 'King Stone' resembles the 'Ring Stone' at Abury, the 'Long Meg' at Southhold, and the 'Friar's Heel' at Stonehenge."

Fergusson speaks of the distribution of stone monuments. He says that there are 20,000 in Algeria. In northern Africa, there are concentric circles, arranged in a series of steps with little towers, 7 to 40 feet in diameter, and triple circles with dolmens in the centre. In India, there are dolmens with two circles surrounding them. There are circles in western Asia. in Brittany, also in Scotland, the Orkneys, Isle of Man, and Isle of Skye. The finest circle is at Stennis, which is composed of 12 stones 15 to 18 feet high, and contains a dolmen. Beyond the stones is a ditch, and surrounding the whole, a wall of earth, 240 feet in diameter. On the Isle of Man, at Mule Hill, is a circle containing eight cists, with a gap between them, like Arbor Low. At Boscawen there are five circles. In Cumberland is a circle 100 feet in diameter, composed of 44 stones, and an outer circle composed of 14 stones; four cairns or mounds being inside of the smaller circles.

Sir John Lubbock differs from Fergusson and calls the circles "open air temples," and refers to Abury and Stonehenge as specimens. He pronounces Abury the greatest of all so-called Druidical monuments. He says:

It is, indeed, much less known than Stonehenge; and yet, though a ruder, it must have been originally a grander temple. According to Aubrey, "Abury did as much exceed Stonehenge as a cathedral does a parish church." When perfect, it consisted of a circular ditch and embankment, containing an area of $28\frac{1}{2}$ acres; inside the ditch was a circle of great stones, and within this, again, two smaller circles, formed by a double row of smaller stones, standing side by side. From the outer embankment started two long winding avenues of stone, one of which went in the direction of Beckhampton, and the other in that of Kennet, where it ended in another double circle. Stukeley supposed that the idea of the whole was that of a snake transmitted through a circle; the Kennet circle representing

the head, the Beckhampton avenue, the tail. Midway between the two avenues, stood Silbury Hill, the largest artificial mound in Great Britain, measuring not less than 170 feet in height. From its position, it appears to form part of the general plan, and though it has been twice examined, no primary interment has been found in it. On the whole, this appears to have been at one time the finest megalithic ruin in Europe; but, unfortunately for us, the pretty little village of Abury, like some beautiful parasite, has grown up at the expense, and in the midst, of the ancient temple, and out of 650 great stones, not above 20 are still standing.

It is evident that Stonehenge was at one time, a spot of great sanctity. A glance at the ordnance map will show that tumuli cluster in great numbers around, within sight of it; within a radius of three miles there are about three hundred burial mounds, while the rest of the country is comparatively free from them.

Both Abury and Stonehenge were, I believe, used as temples. Some of the stone circles, however, have been proved to be burial places. In fact, a complete burial place may be described as a dolmen, covered by a tumulus, and surrounded by a stone circle. Often, however, we have only the dolmen, and sometimes, again, only the stone circle. The celebrated monument of Carnac, in Brittany, consists of 11 rows of unhewn stones, which differ greatly, both in size and height, the largest being 22 feet above ground, while some are quite small. It appears that the avenues originally extended for several miles, but at present they are very imperfect, the stones having been cleared away in places for agricultural improvements. Most of the great tumuli in Brittany probably belong to the Stone Age, and I am, therefore, disposed to regard Carnac as having been erected during the same period.

Megalithic erections, resembling those which are generally, but without sufficient reason ascribed to the Druids, are found in very distant countries. In Moab, De Saulcy observed rude stone avenues, and other monuments, which he compares to Celtic dolmens. Lieut. Oliver, also, mentions that the Hovas of Madagascar to this day erect monoliths and stone tombs, closely resembling those of western Europe. Mr. Maurice was, I believe, the first to point out, that in some parts of India, there are various monuments of stone, which, in the words of Colonel Yule, "recall strongly the mysterious, solitary or clustered monuments of unknown origin, so long the puzzle and delight of antiquarians, which abound in our native country, and are seen here and there in all parts of Europe and western Asia. Mr. Fergusson goes further, and argues with great ingenuity that the "Buddhist architecture in India, as practised from the third century B. C. to the seventh A. D., is essentially tumular, circular, and external, thus possessing the three great characteristics of all the so-called Druidical remains.

It is a very remarkable fact that, even to the present day, some of the hill tribes in India continue to erect menhirs, cromlechs, and other combinations of gigantic stones, sometimes singly, sometimes in rows, sometimes in circles, in either case very closely resembling those found in western Europe.*

That the circles were open-air temples is shown in the fact that a house built and set apart for the purposes of worship was, according to Tsountas, "an unfamiliar thing in the days of Homer, nor was it a necessity of primitive religion."†

Jacob Grimm says: "In the oldest expressions in Germany, the temple cannot be disassociated from the Holy Grove. Temple and forest are convertible terms. What we conceive as a house, built and walled in, passes as we go further into earlier times,

* "Prehistoric Times," by Sir John Lubbock, Bart., pp. 119-127.

† "The Mycenaean Age," Tsountas and Christos, p. 308.

into the idea of holy ground, hedged in and surrounded by trees, never touched by the hand of man."

Tsountas says: "After all, the altar in the house or in the open air, must have satisfied the requirements of the Mycenaean Age. The altar was either a simple heap of stones, or a more regular structure, like that on a painted tablet, in either case, raised to a considerable height above the ground."

The altar discovered in the courtyard at Tiryns, is a case in hand. Altars have been discovered in Westmoreland, England, and with long passage ways of standing stones leading to them. As to the orientation of the circles, there seems to be more uncertainty. Still, the archæologists, such as Mr. A. L. Lewis, Mr. Flinders Petrie, and most of the Egyptologists, Mr. Norman Lockyer the astronomer included, maintained that they were. Mr. A. L. Lewis has given much attention to the subject, and has read many articles before the Anthropological Institute of Great Britain. An article recently published in the American Antiquarian contains a resume of his studies.

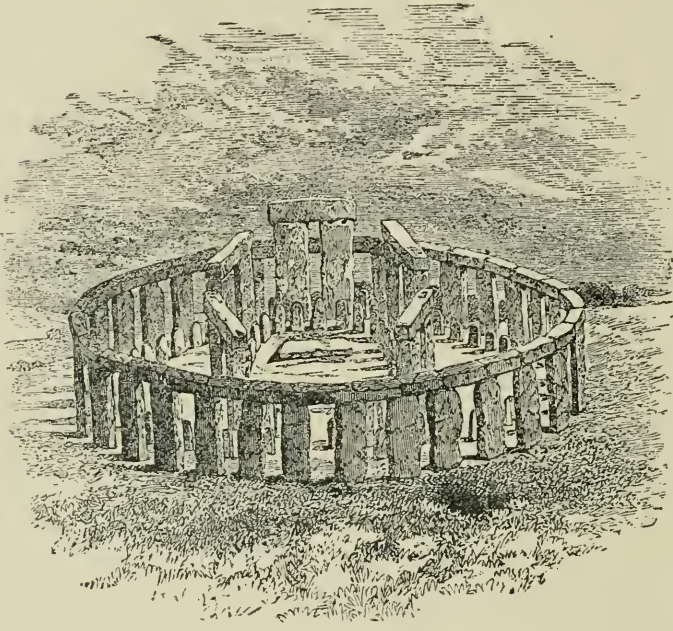
There are certain antiquities which, though not absolutely confined to Great Britain, are more numerous there, than in any other part of the world, and are of greater size and importance there than in all the rest of the world, so far as it has been archæologically explored. These are the circles of stones, of which Stonehenge is best known, especially to Americans.

These circles may be divided into three classes: 1. Hut circles, or continuous circular walls, seldom more than three feet high, and generally formed of blocks as thick and broad as they are long, which are the lower parts of prehistoric dwellings; these vary in diameter from ten to thirty feet, the larger ones having often had central supports for the roof in addition to the circular walls. 2. Small circles of rather thin flat stones set on edge, which have been placed round the bases of sepulchral tumuli, either close to them as retaining walls, or as fences or ornaments at a little distance from them. 3. Circles of separate upright stones, which are generally much larger than the circles of the first and second classes, for their diameters vary from 60 to 380 feet, while the great circle of Abury was at least 1,100 feet in diameter. The stones of which circles of this kind are composed also vary in size, from pillars less than three feet high and a foot or so in width and thickness, to monoliths twenty feet high, six feet wide and three feet thick, like the largest at Stonehenge; or masses fifteen feet high and broad, and six feet thick, like some of those which still remain at Abury. Some of the stones of these circles are more or less rudely shaped, but most of them show no sign of working.

The present article will be confined to the consideration of circles of the third class, and of their possible objects, with regard to which archæologists are by no means agreed, for, while circles

of the first class have clearly formed parts of dwellings, and those of the second class are unanimously admitted to have formed parts of tombs, there are points about those of the third class which are differently interpreted by different writers, and regarded as purely accidental and meaningless by others.

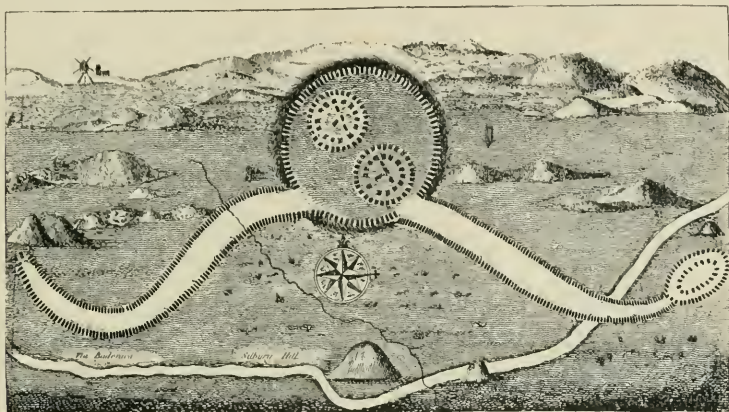
Of all circles, large or small, the best known and most numerous visited is Stonehenge (eight miles from Salisbury). The outer circle at Stonehenge is 97 feet in diameter inside, and, when (if ever) complete, consisted of thirty stones, each about thirteen feet high, the tops of which were connected by stones laid across the spaces between them, which stones were kept in



STONEHENGE RESTORED.

place by projections on the tops of the upright stones which fitted into holes made in the horizontal stones. Within this circle was another of small upright stones, which, if ever complete, numbered about forty-four. Within these again were five groups of three stones each, two upright supporting one horizontal, the latter being kept in place by tenons and mortices cut in the solid stone, like those of the outer circle; these five groups of trilithons were arranged in the form of a horseshoe, the highest being to the southwest, with two lower ones on each side, and an opening nearly forty feet wide between them to the northeast. Inside this horseshoe of trilithons was another, consisting of nineteen upright stones, from 10 to 12½ feet high (the highest being in

front of the highest trilithon), with an opening to the northeast coinciding with that of the horseshoe of trilithons. Within these, and in front of the great central trilithon, was a flat stone, more than 16 feet long and $2\frac{1}{2}$ wide, which is usually called the "altar stone." A trench and low bank surround the circle at a distance of about 100 feet; an avenue, marked out by earthen banks, leads from the trench in a northeasterly direction, and at a distance of 96 feet along this avenue is a large upright stone, with a pointed, but unworked top, known as the "Friar's Heel," which is in such a position that anyone standing on the "altar stone" on the morning of midsummer day may see the sun rise just over the top of the "Friar's Heel." Some say that this stone has no connection with the circle, but marks probably an isolated burial; but, if the stone were not there at all, the arrangement of




ABURY ACCORDING TO STUKELEY.

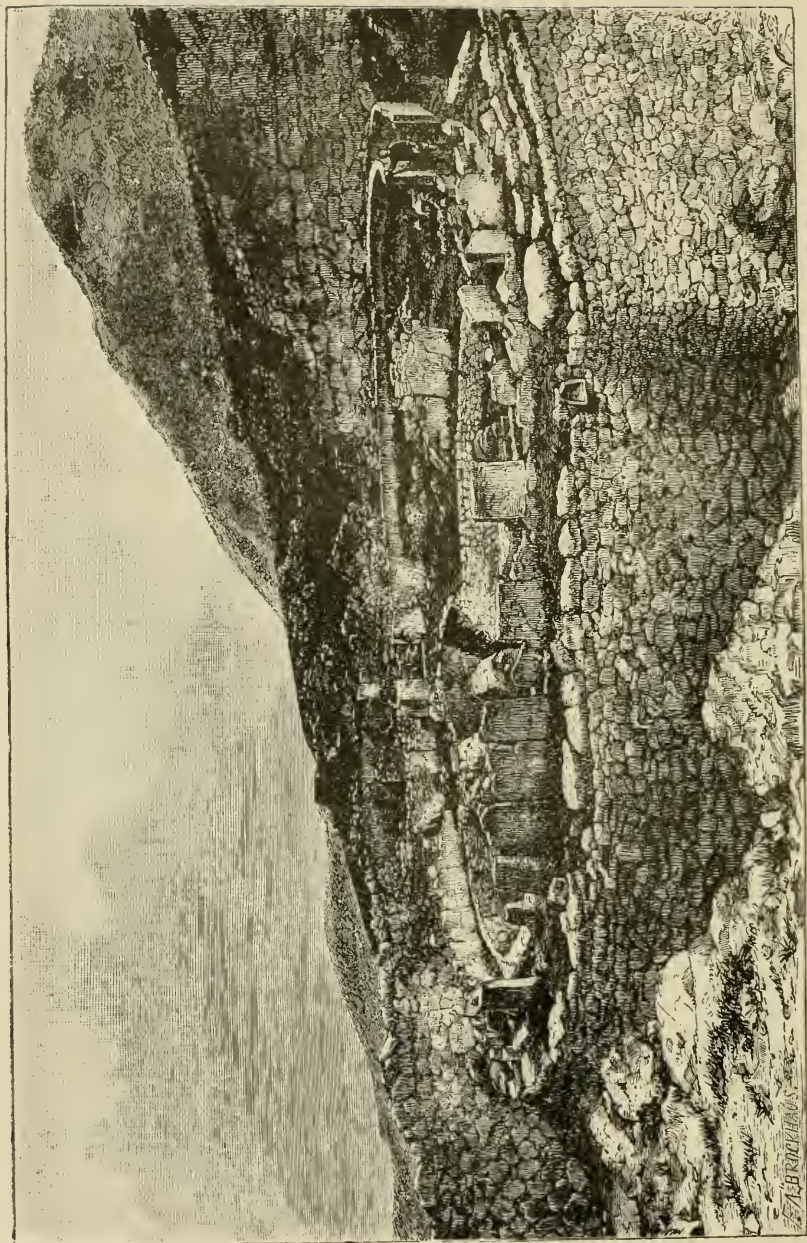
the circles and of the avenue would still point unmistakably in the direction of the midsummer sunrise.

Though I have omitted many details which have caused much discussion among archæologists and others, I have described Stonehenge at considerable length, because it is unique as regards the cap stones connecting the upright stones, and in some other particulars; and because it combines characteristics of different localities in a way no other circle does, and gives a key to the object of other and, as I think, older ones, for my impression is that Jeffrey of Monmouth's statement that Stonehenge was set up as a memorial of some British nobles treacherously murdered by the Saxons, is very likely to be correct. If so, it was probably erected in its present form on the site of an older circle, by Britons, who, though Christians themselves, had some knowledge of the rites and ceremonies of pagan times and adopted this form of memorial to show their connection with the pre-Roman inhabitants, and it may in that case have been the only solar temple in which the sun was never adored.

If the "Friar's Heel" at Stonehenge were really set up to mark the midsummer sunrising point, there should, it would seem, be some indication of the same point in other circles, and it is to this that I have directed particular attention, with the following results:

Single stones are to be found, or are known to have existed, to the northeast of the following circles: The Rollrich, near Chipping-Norton in Oxfordshire; "Mitchell's Fold," Shropshire; Winterbourne, Wiltshire; Winterbourne, Dorsetshire; Scorhill on Dartmoor, and Dance Maen, near Penzance, Cornwall. At Abury in Wiltshire, and Arbor Lowe in Derbyshire, the circles were surrounded by high banks which shut out the horizon from the view of those inside them, and at both places a shrine, technically called a "cove," consisting of 3 stones forming 3 sides of a square,  the open side of which faced northeast, stood in the centre. At Stanton Drew, near Bristol, there is a group of three circles and some other stones which are arranged in lines with each other, and apparently at carefully proportioned distances, some of which may have a symbolical meaning; in one of these lines a circle occupies the position to the northeast of the principal circle, which is elsewhere occupied by a single stone. A "cove" similar to that at Abury stands near these circles.

Near Penmaenmawr in North Wales there are two fallen stones northeast of a circle, but being in a valley they would not be of much use as indicators of the sun-rising point. However they direct the eye to a group of three hills beyond. At Mitchell's Fold in Shropshire there is, or was, also a stone in a northeasterly direction, but the sun-rising point is occupied by a high hill, beyond which, in the same line, and at an equal distance, is another circle, called the "Hoarstone," or Marshpool Circle, beyond which, again, is a group of three low hills. The observation of these facts led me to think that in hilly countries the circle builders had (very wisely) placed their circles in such a position that some prominent hill top should fulfil the function of indicator, which on level ground was discharged by a single stone. I am now inclined to think that the order of precedence may have been the reverse, and that the hill may have been the first to be made use of, the single stone being set up where a hill was not available. Be this as it may, hills take the place of stones to the northeast of circles not only in Wales and Shropshire, as already stated, but at Fernworthy on Dartmoor, at Stannon, at Leaze, at the Trippet Stones and Stripple Stones, and at Boskednan, all in Cornwall. In Cumberland, again, there is another variation; instead of the stone or hill being to the northeast of the circle, the circle is to the northeast of the stone or hill, but the line of orientation remains the same—southwest to northeast. Thus, at "Long Meg" and her "Daughters," the single stone called "Long Meg" is southwest of the circle formed by the



GRAVE CIRCLE AT MYCENÆ

other stones (the "Daughters"); while at Swinside the most prominent hill near—Black Combe—is southwest from the circle, and a group of three smaller hills is northeast from it.

These statements by Mr. A. L. Lewis apply only to the Stone Circles of Great Britain. They conform to the common opinion that these circles were erected for two or three purposes; first, to mark off the burial places and separate them from the surrounding area, very much as does the fence, around the modern grave yard; second, to serve as an open air temple, the openings into them being so as to admit of large processions but the center being used as altars or places of sacrifice; third, to enable the people to watch the course of the sun and to mark the time of the solstices, or in other words, to serve as calendar stones on a large scale. We may say that the English Archæologists have recognized all three uses in the stone circles of Great Britain.

Joseph Anderson says:

The circles of erect stones which mark off the grave ground from the surrounding area, are memorials of moral significance, whether they be regarded as marks of filial piety and family affection, or of more public sympathy and appreciation of worth. In all the instances the circle of stone setting, whatever may be the precise form which it assumes, has been found to be the external sign by which the burial ground is distinguished from the surrounding area. Like the cairn, it is the visible mark of the spot of earth to which the remains of the dead have been consigned.

The circles in France differ from those of Great Britain in that they generally were used to mark off the graves from the surrounding country.

The plate given herewith shows a large number of stone circles, cromlechs, stone cairns, dolmens, menhirs and circles in the Necropolis of Brittany. It will be noticed that some of these are surrounded by small stone circles; that the standing stones or menhirs are arranged in a circular form, but there is no large circle such as is found at Stonehenge and Avebury, and yet it may be, that the alignments served somewhat the same purpose as the large circles.

The most interesting circle is that which was found by Dr. Schliemann while exploring the tombs at Mycenæ. These tombs were arranged in the form of a circle. They were not used as an open air temple, but may have served the purpose of a grave circle.

Tsountas says:

"The Mycenæan tombs are of two general types. The first is that of the oblong pit, sunk vertically in the ground, very much like the modern grave; the second includes the bee hive or tholus-structure and the rock-chamber, approached alike by an avenue (dromos) cut horizontally into a hill side. It is the second which offers the great monuments of sepulchral architecture; but the shaft graves are obviously earlier in origin, as they were the first and are still the foremost in their contribution to our knowledge of the age to which they belong. They are therefore entitled to the first consideration.

If the visitor to Mycenæ enter the Citadel by the Lions' gate, and turn to the south, twenty paces more will bring him to the entrance of

a unique circular enclosure. It is eighty-seven feet in diameter and fenced in by a double row of limestone slabs set vertically in two concentric rings. These rings are about three feet apart, and the space between them was originally filled with small stones and earth and then covered with cross-slabs of the same kind with the uprights, six of which were found in place.*

The result is a wall some four and one-half feet thick and three to five feet high, the variation being due to the slope of the rock from east to west; for this curious ring-wall does not enclose a level space. On the contrary, the ground falls off so abruptly that on the west a Cyclopean retaining wall over eighteen feet high (at the maximum) had to be built for the support of the terrace, and even this wall is still two feet below the level of the native rock in the eastern part of the enclosure.

The plate shows the character of this circle and the cyclopean walls surrounding it, but does not show the altar which was found over the center of the fourth tomb. This altar according to Dr Schliemann consisted of an almost circular mass of Cyclopæan masonry with a large round opening in the form of a well. It was found four feet high and measured seven feet from north to south and five and one-fourth feet from east to west. It shows that close above the grave circle a place of sacrifice had been established so that what-ever we may say about the graves themselves there was a form of worship observed in this place, which perhaps resembled that at Stonehenge in Great Britain. The rich offerings of gold and silver, and the style and decoration of the ornaments show that it belonged to a period later than the stone age for they revealed a wealth and splendor such as only could have been displayed by a kingly race.

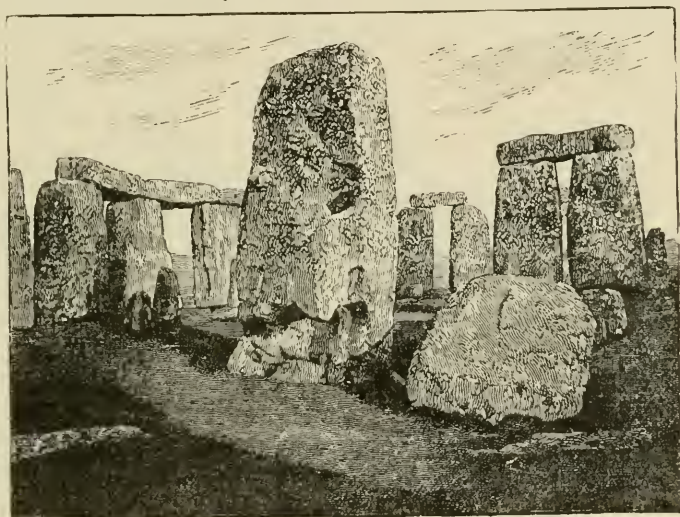
We turn now from these circles of the old world to those found in the new world, with the special object of tracing the analogies between them. We may say that there are in Peru certain stone circles, which very closely resemble those in Algeria, for they are arranged in terraces and furnish evidence of having been used in connection with sun worship. The near circle is ten feet in diameter, the further one has a grooved out-lying platform one hundred and fifty feet in diameter. The two show the prevalence of sun worship. Another locality in Bolivia presents a square two story burial tower (Chulpa) with hill fortress (Pucura) in the distance situated east of Lake Titicaca.

The most interesting locality where circles and circular enclosures are found is in the state of Ohio which was the center of the mound builders works. Here we find the burial mounds and altar mounds without circles, but there are many mounds and so called temple mounds, which were surrounded by earth circles with a ditch upon the inside of the wall and a platform surrounding the mound, and a single entrance through the wall and across the ditch giving access to the burial place or altar. There are also earth circles, which were used only as

*These covering slabs (according to Schliemann) "are firmly fitted in and consolidated by means of notches, forming a mortise and tenon joint" (Mycenæa p. 124). There was also an avenue to the grave circle reminding us of those at Avebury.

village enclosures but in certain cases mounds have been seen occupying the very center of the village enclosure with a stone pavement surrounding them, showing that these were used either as a place of worship or burial too sacred for intrusion. The most notable and interesting of all the circles found in America are those near Portsmouth, Ohio. These are interesting because they so remarkably resemble the circles at Stonehenge and Avebury in Great Britain. They were explored when they were in good state of preservation by several parties. Squier and Davis gave a description of them as follows:

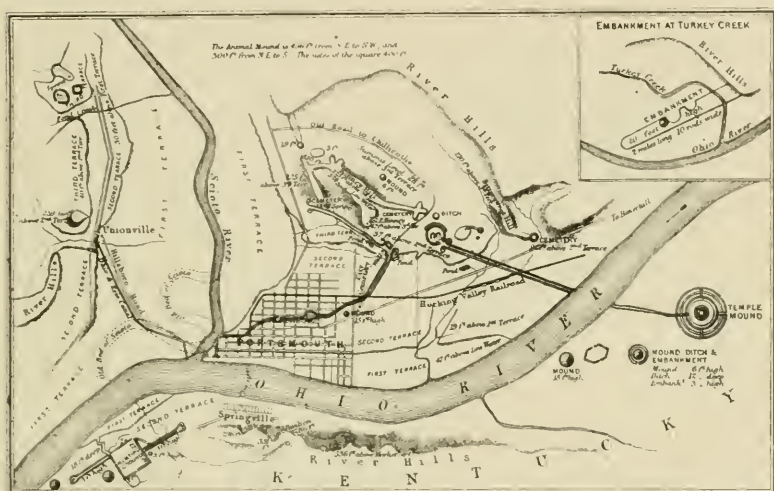
"The work consists of three divisions or groups, extending for eight miles along the Ohio River. Two of the groups are on the Kentucky side of the river, the remaining one, together with the larger portion of the con-



PART OF THE CIRCLE AT STONEHENGE.

necting embankment is on the Ohio shore. The avenues or covered ways, extending from one work to the other, have induced many to assign them to a military origin and a design to protect communication between the different groups. The parallel embankments measure about four feet in height by twenty feet base. They are not far from one hundred and sixty feet apart. They run in three lines from the central group, one leading to the southeast, one to the southwest, and one to the northwest, each one of them pointing to important works on the opposite sides of the river. The total length of the parallels is eight miles, giving sixteen miles of embankment. The group upon the third terrace seems to be the grand center from which the parallel lines radiate. The two crescent or horse-shoe-shaped walls constitute the first striking feature which presents itself. They are of about the same size and shape, and measure eighty feet in length by seventy in breadth. Enclosing them in part is a circular wall, about five feet high. A mound twenty-eight feet high, one hundred and ten feet base, truncated and surrounded by low circumvallation, stands near, from the summit of which a full view of the entire group may be had. The group

four miles southeast to the river, and are continued on the opposite side till they reach a large circular work which was probably a temple of the sun. The outer circle of these works measures six hundred and forty feet, the second one about four hundred feet, the third about three hundred feet. In the center of the innermost circle is a mound which rises forty-five feet above the surrounding surface. It has a spiral graded way leading to the top, which measures fifty feet east to west and seventy-five feet north to south. This was probably the high altar, and ceremonies performed on it could be readily witnessed from the surrounding mounds. The "temple" consists of three embankments pierced by open ways leading north, south, east and west. A center mound and four ditches, the last to be passed only by the road leading from the "citadel," the entire length of which was protected by parallel walls. About a mile and a half west of the temple is a circular embankment about six feet high, and an inner ditch twelve feet deep. It has a center mound about seven feet high and the entrance to it is from the south. Beside it is an enclosure in the form of an irregular



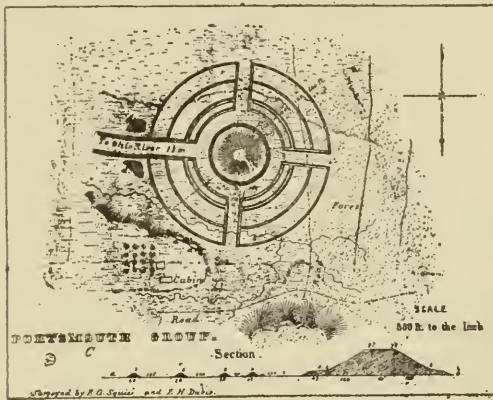
CIRCLES AND AVENUES AT PORTSMOUTH, OHIO.

hexagon. It measures one hundred and twenty feet by seventy-five feet. The embankment is four feet high and the ditch three feet deep. There are two entrances, facing northwest and southeast. All these have probably some connection with the temple."

Dr. Hempstead's view of the orientation was derived from the relative bearing of the so-called temple and the central group on the upper terrace where there was an altar and the horse shoes. He says:

"The temple when viewed from the group on the upper terrace on the north side of the river would mark the spot at which the sun arose and a square enclosure situated northwest would mark the sunset of the summer solstice. This last enclosure has also four entrances like those of the temple face north, south, east and west. This enclosure is on the west side of the Scioto River. There are also other parallel embankments, running from the central circle and horse shoe southwest terminating at the river but expanded so as to form a considerable enclosure, with small mounds constructed at the ends as if to fortify the entrances. Across the river and nearly facing the end of these parallels, is what has been known as the "Old Fort." A careful examination of this work will satisfy any one that it was never intended as a protection against enemies from without

but was calculated to keep any thing within, after it had once been decoyed or placed there. The whole work is commanded from the hills; the wall on the outside is only two or three feet high. An enemy having gained this eminence could annoy those within from all parts of the embankments. There are many strong reasons for believing that the enclosure was intended to entrap the large animals which roamed over the hills and ranged through the valleys at the time. The design of these circles and enclosures is difficult to determine but the general opinion is that they were erected for religious purposes, and considering the fact that sun worship was prevalent among the Mound-builders of this region, it is not unlikely that the enclosure on the southwest side was designed to keep captives taken in war, and that the whole group was designed for religious ceremonies, among which was the sacrifice of human victims, captives taken in war, as an offering to the sun.



CONCENTRIC ORIENTATED CIRCLE.

Comparing these works at Portsmouth with those at Avebury in England, we find that the large circles which include the horse shoes correspond to the large circle near Silbury Hill, that is the large circle which contains two other circles. The concentric circle which contains the so-called temple mound corresponds to the

circle at Kennet. The enclosure at the mouth of the Scioto corresponds to the work at Beckhampton, and the covered ways which connect these circles correspond with the alignments of standing stones which run from the large circle in the two directions, one toward Beckhampton, the other toward Kennet. The space between the parallel ways and the Ohio river corresponds with that at Avebury included between the large circle and the small stream, in the midst of which rises the artificial mound called Silbury Hill. These make important resemblances, though they do not prove an identity of form or design. They, however, suggest that there were important ceremonies which were connected with a form of sun worship which had many points of resemblance.

CHAPTER VI.

BOATS, ROADS, BRIDGES AND ANCIENT CANALS.

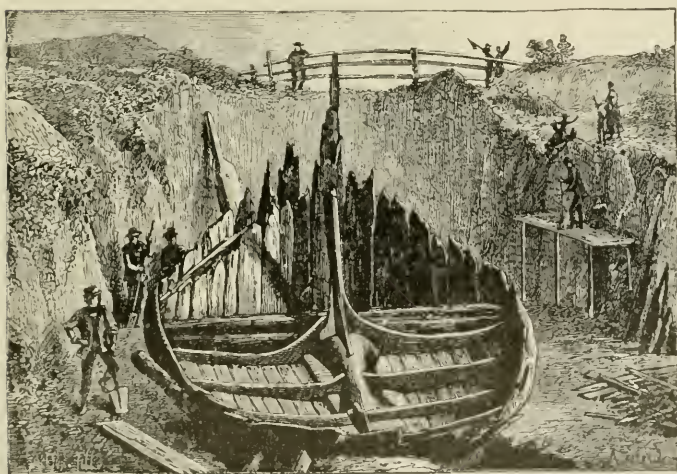
We have now passed over the various structures which were erected during the pre-historic age, and have seen the progress which was made during that age. It will be noticed that none of these structures reached the stage in which architecture, technically considered, could be ascribed to them; for they are in no way ornamented, and do not present any of the architectural principles. Some of them may have indeed anticipated those principles in their form and appearance; for the standing stones have the forms of columns; the conical huts, called Pict-houses, have the form of the arch; the dolmens have the form of houses with roofs, and some of them have openings, which remind us of the doorways with the pier and lintel, but they all lack the elements which are essential to architectural structures; viz: the true arch; the column with its capital; the cornice, and architrave; and the decoration of the walls and sides. They contain the rudiments which constitute the alphabet, but are never put together in such a shape that we can read in them any story which architecture, as such, would present. We may say, then, of architecture, the same that we do of literature, that neither of them really began before the time of history; for the use of letters was the means of introducing writing, and writing naturally gave birth to history; as the discovery and use of architectural principles, such as the true arch, the decorated column, the cornice, and other elements, gave rise to architecture; at least to that form of architecture which has appeared in historic countries. As to the date in which those changes occurred which brought the rude constructions of the pre-historic races into the condition, or form, which rendered them suitable and worthy of the name of architecture, we have no definite information. And yet, as we examine the different records, here and there, we find that the introduction of letters and the discovery of architectural principles were everywhere contemporaneous. There was, however, always an interval between the pre-historic and the historic which has never been quite filled, and it matters not what country we visit, we find the gap still open. No discovery has yet brought the pre-historic so closely into contact with the historic that we can say that they are joined together. The missing links have been sought for in many lands, but they are still missing, and the only way to bring the two ages together is to substitute something which we know belongs to both, and has continued through all ages. These substitu-

tes we believe may be found in some of the common things which were in use in the very earliest times, and are still in use, but are scarcely noticed because they are so common. We refer now to roads, canals, bridges and boats, all of which are very common at the present day, but were also as common in the days when there was no history, and no architecture, and no art, and scarcely any civilization, but when the people had to have the necessities of life, and did have them, and with them also many of the conveniences. They grew out of the necessities of the early periods but they were the last to change their form, or character, and for that reason, they have lagged behind the progress of the world, and have always been too insignificant to be worthy of a prominent place in history. There are to be sure many allusions in history to the ancient canals, roads, bridges and boats, but they are merely incidental to the record, and are not given a place among any of the prominent and conspicuous structures which have appeared either in the pre-historic, or the historic age. Their association with other things such as houses, fortresses, palaces, temples, cities, arches, and gateways, has always been very close, but they were only the humble servitors which were always useful, but seldom noticed, and never considered worthy of mention. Even the terms which are used in connection with them are significant of their humble character; for they are called constructions and mechanical contrivances, rather than architectural works, and are assigned to the province of civil engineering and mechanics rather than architecture or art.

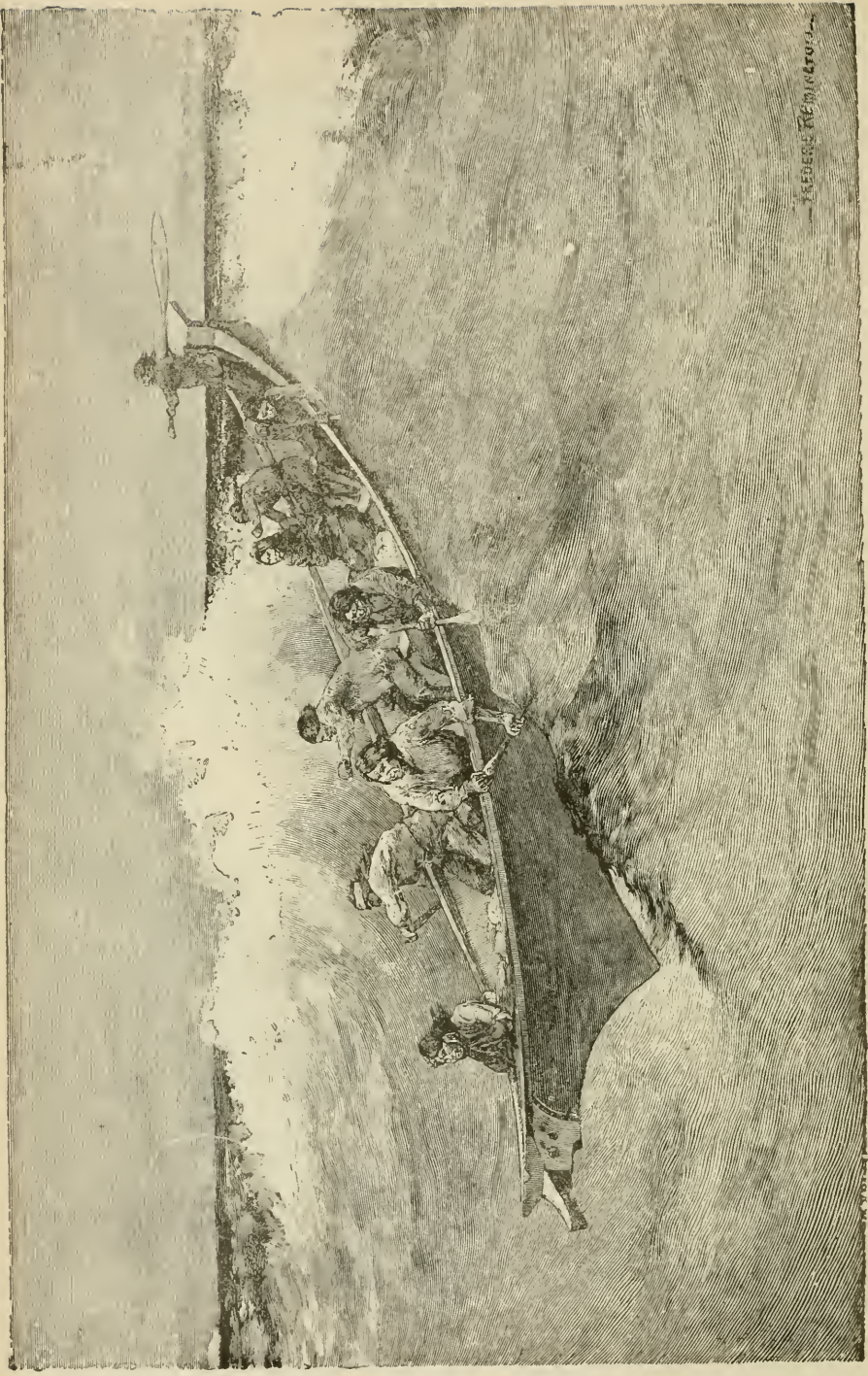
It is, however to this humble class of constructions that we shall devote a chapter; for they are really the connecting links between the pre-historic and the historic age; and are about the only things which we can positively state have continued through both ages. They may indeed have been at the beginning very rude and primitive, yet they served the same purpose at the outset that they do at the present day. The roads upon the land, the canals with the water in them, the bridges which carried the roads across the water, and the boats which conducted the traveler through the water, were all at one time very simple and rude contrivances, but they were as useful then as they are now. They have been useful in history; and great events have turned, and been decided according to their presence or their absence. Many archæological discoveries have also been made by means of them, and still others are likely to be made. To illustrate: it was a road which led up to the Lions Gate at Mycenæ, which disclosed, not only the peculiar arch with its pier and lintel, and its sculptured lions, but which, followed within the gate, led Schliemann to the Beehive tomb, and to the wonderful treasures contained within it. It was a common road which led to the gateway, which opened into the city of Troy, a burnt city, but within the portal of that



A DUGOUT AND SAVAGE—PRE-HISTORIC.



CLINKER-BOAT FROM NORWAY—HISTORIC.



FREDERICK W. H. H. H.

BOAT ON NORTHWEST COAST.

city, and amid the ruins, there were contained those evidences which led Schliemann to identify the place with the famous city about which Homer sang of old, and in which history has been so much interested. The stairway which led from the gate up to the city was a common stairway made of stone steps, but it became very significant when the treasure was discovered, for it identified the building at the top as the palace of Priam. His keen eye when he examined the relics which were so strangely mingled together, immediately discriminated between those which belonged to the Stone and those which belonged to the Bronze Age, and enabled him to draw the lines between the earlier and the later cities which were erected upon the same spot, though the lines between the historic and the pre-historic cities became marvellously less as he, with others, proceeded in the examination of the various layers, and relics which were contained in the ruins.

The importance of these common things is shown by other discoveries, for they have often furnished the clew to the dark problems of history.

The arch which Robinson discovered in the wall of the temple at Jerusalem was only a fragment, but it showed the character of the bridge which led from the ancient city of David across the Tyropæan Valley to the ancient temple on Mount Moriah. The various sills, or thresholds which Dr. W. H. Bliss found at Jerusalem, far beneath the surface, were ordinary door-sills which had been worn by the feet of people who crossed them, but the succession of them one above the other, showed the number of houses that had been built on the same spot. The boat which was discovered on the coast of Norway, beneath a mound, was an ordinary boat, such as the Norsemen were accustomed to use, but taken with the canoes and boats which have been exhumed from the peat-beds of Ireland and England and Switzerland it gave the last link in the long chain, and furnished the record of the progress of boat building from the pre-historic up to the historic age.

So those constructions which have been brought to light by the researches of antiquarians and archeologists reveal to us the very beginnings of architecture. They may, perhaps, belong to the department of mechanics and engineering, as we have said, but they so resemble, and are so associated with architectural works that it is impossible to separate them. The relation of these humble and common things to the events of history is exceedingly important. Xerxes who built his bridge of boats across the Hellespont is said to have thrown chains into the sea whose waves had broken the bridge, with the vain boast that he had chained the waves, but the absence of a bridge has baffled many a general, and the lack of a road has defeated many an army, while on the other hand an ordinary canal has enriched a whole country, and the building

of a road has often brought the distant parts of a nation into harmony with its rulers.

We need no excuse for devoting a chapter to these subjects; for they are too closely connected with history and throw too much light upon the history of the world to be omitted. Without them, the gap between the pre-historic and the historic age would continue, for very little has so far been discovered that can be relied upon to fill it, but, with them, the succession continues unbroken. We may say that the monuments of the Stone Age stand like an abutment upon one side of a gulf; for the successors to them have not yet been discovered. The monuments of the Bronze and the Iron Age stand like an abutment upon the other side, and it is not easy to discover what immediately preceded, but it is through such humble and unobserved things as the bridges, boats and such objects as have been preserved in the graves we find the connecting links, and are able to follow the line from one age to another.

These had their beginnings in the Stone Age, but they continued in an unbroken succession through the Bronze and Iron Ages, and really connect the pre-historic with historic times.

This is the case in all countries, and it matters not what region we enter, we shall find these common things very useful, from the aid they give to us in connecting the past with the present. It may be that some would prefer to begin with the Oriental countries, and there seek for the connecting links between the historic and the pre-historic age, but there are so many advantages in taking the American continent for our field of study, that we shall draw illustrations from our own land, and afterwards go to the distant regions, and study such tokens as can be found there.

We maintain that there are all about us, those objects which are really the survivals of the pre-historic age, and they are so similar to those which existed thousands of years ago in the east that we may rely upon them for our evidence.

1. Let us then take the boats which were formerly in use on this continent; some of them still used by the Indians of the deep interior for our first objects of study. It is known that the earliest boat was a mere log, which had been dug out with stone tools, and by the aid of fire, was made hollow, and so capable of holding the early navigator, who was clothed with skin, and had no better tool than the stone axe. Such hollow logs have been discovered near the lake dwellings of Switzerland, but they resemble those which were common in America. This was the beginning of ship-building and ship-carpentry, and it was a very important beginning. The next stage was one in which the external form was brought into harmony with the interior. A comely shape

was given to the boat. The log became not only lighter but more shapely, and more easily propelled. It was not long before the habit of imitating the shape of animals asserted itself in connection with this art of boat building, and the canoe soon came to have a curved prow, which rose above the water line like the neck and head of a water fowl. A canoe has been dug out from the peat beds of Switzerland, which has a prow the exact shape of a bird's head, a hole through the solid end of the prow representing the eye of the bird. This shows how early the art instinct laid hold of the savage, and trained his hand to great skill in sculpturing the wood into forms and lines of grace and beauty. The navigators of the inland waters of America were not different from the fishermen who inhabited the shores of the inland lakes of Europe, for both had skill in the art of making beautiful creations out of the common logs, which were felled in the forests. Boats have been exhumed from the island keys off the coast of Florida, which are very interesting on account of their size and shape. There are boats still in use on the streams of the Interior which are models of beauty. But of all the crafts which the native American was able to construct by the aid of such rude tools as are made of stone, those which are still seen upon the northwest coast are the most striking; for their beauty and grace. These are large enough to hold a company of navigators, and high enough to withstand the waves of the stormy ocean. Their graceful bows rise high above the rest of the vessel, and are generally painted and ornamented with some mythological figure, representing some bird or beast which rules the waters. Propelled by the strong hands of the skillful navigators, they fly over the waves like winged birds and no storm arises which intimidates the hearts of those who know how they may outride the waves. Such boats are still common on the northwest coast, but there were formerly boats and canoes equally beautiful and capacious on the inland waters of this continent. A fleet of such boats is said to have attended the Queen or cacique of Cofachiqui who met De Soto as he passed on his famous expedition. "This fleet formed a kind of aquatic procession, the van of which was led by a grand canoe, containing six ambassadors, paddled by a large number of Indians, towing after it the state barge of the Princess who reclined on cushions in the stern, under a canopy supported by a lance. She was accompanied by eight female attendants. A number of canoes filled with warriors closed the procession." Other fleets, containing warriors were seen by De Soto on the Mississippi River. One of these is described as follows:*

One day while at work they perceived a fleet of two hundred canoes

*See Irving's Conquest of Florida.

descending the river. They were filled with armed Indians, painted after their wild fashion, adorned with feathers of every color, and carrying shields in their hands, made of the buffalo hide, wherewith some sheltered the rowers, while others stood in the prow and poop of the canoe with their bows and arrows. The canoes of the cacique and chief warriors were decorated with fanciful awnings, under which they sat and gave their orders to those who rowed. "It was a pleasing sight," says the Portuguese narrator, "to behold these wild savages in their canoes, which were neatly made and of great size, and, with their awnings, colored feathers and waving standards, appeared like a fleet of galleys."

In contrast with these are the boats which are now in use among the fishermen of the Arctic regions.

H. H. Bancroft says:

Throughout the Aleutian Islands the boats are made wholly of skins of seals or sea-lions, excepting the frame of wood or whale-ribs. Two kinds of skin boats are employed by the natives, a large and a small one. The large boat is flat-bottomed with the skeleton of whale ribs, covered with seal skins sewed together. The small boat is called a *Kyak*, and is entirely covered with skins, top as well as bottom, saving a hole in the deck which is filled by the navigator. The *kyak* is about sixteen feet in length, and two feet in width at the middle, and tapers off to a point at either end, is light and strong and is skillfully handled. The native will twirl his *kyak* completely over, turn a summersault, and by the aid of his paddle, come up safely at the other side. Sleds, sledges and dogs, and land-boats play as an important part on the land as these skin boats do in the water. The runners of the sleds are thin, flexible boards, which are well adapted to the inequalities of the ground.

The Haidah canoes are dug out of cedar logs, and are sometimes sixty feet long, six and a half wide, and four and a half deep, accommodating one hundred men. The prow and stern are raised, and often gracefully carved like a swan's neck, with a monstrous head at the extremity. Boats of the better class have their exteriors carved and painted with the gunwale inlaid in some cases with otter teeth. They are impelled rapidly and safely over the often rough waters of the coast inlets by shovel-shaped paddles. Large fleets of canoes from the north visit Victoria each spring for whaling purposes.

The Nootka Sound Indians build their canoes from a single cedar trunk. Of the most elegant proportions, they are modeled by the builder with no guide but the eye, and with the most imperfect tools. The form varies among different nations according as to whether the canoe is intended for ocean, sound or river navigation. They rub and polish the outside and paint the interior with red."*

Californians built their boats out of red wood and cottonwood trees. They were blunt at both ends and flat bottomed, but what is very remarkable, some of them are built without being touched with a sharp edged tool of any kind. They are burned off at the required length and hollowed out by fire. A piece of fresh bark, occasionally wet, prevented the flames from extending too far in the wrong direction. They built rafts from bundles of rushes which were lashed together in hammock shapes. They are useful for salmon-spearing, and for fishing.

In contrast to these boats of California are the large canoes which are said by the early Spanish explorers of Mexico to have been so numerous on the lake, which was the scene of so many exploits at the time of the Conquest. These accounts are evidently exaggerated but we quote from Ban-

*See Bancroft's *Native Races of the Pacific States*; Vol. 1; p. 166—190.

croft's description of them and leave the reader to form his own opinions.

"Owing to the position of the city in the midst of the lake, traffic was chiefly conducted by means of canals, which led into almost every ward and had on both sides quays for the reception and landing of goods and passengers. Many of these were provided with basins and locks to retain the water within them, while at the mouth were small buildings which served as offices for the custom house officials. Bridges, many of which were upwards of thirty feet wide, and could be drawn up so as to cut off communication between the different parts. The circumference of the city has been estimated at about twelve miles, and the number of houses at sixty thousand. Fifty other towns, many of them consisting of over three thousand dwellings, were scattered on and around the lake, the shallow waters of which were skimmed by two hundred thousand canoes. Four grand avenues paved with a smooth, hard crust of cement, ran east, west, north and south crosswise, forming the boundary lines of the four quarters, at the meeting place of which was the grand temple court. Three of these roads connected in a straight line with large causeways leading from the city to the lake shores; constructed by driving in piles, and filling in the intervening spaces with earth, branches and stones. They were broad enough to allow ten horsemen to ride abreast with ease, and were defended by draw bridges and breast works. Half a league before reaching the city this causeway was joined by the Zolac road, coming from Xochamilco, the point of junction being defended by a fort surrounded by a battlemented wall twelve feet high, and provided with two gates through which the road passed. A fourth causeway from Chapultepec served to support the aqueduct which supplied the city with water.

The chief resort for the people was the levee, which stretched in a semicircle around the southern part of the city. Here during the day the merchants hustled about their cargoes, and the custom houses while at night the promenaders resorted there to enjoy the fresh breezes from the lake. Among the arrangements for the convenience of the public may be mentioned light houses to guide the canoes which brought supplies to the great metropolis. These were erected at different points upon towers and heights. The streets were lighted by burning braziers placed at convenient intervals. A force of a thousand men kept the canals in order. The numerous fountains which adorned the city were fed by the aqueducts, which brought water from the hill of Chapultepec about two miles off, and was constructed upon a causeway of solid masonry five feet high and five feet broad, running parallel to the Tlacopan road. This aqueduct carried a volume of water equal to a man's body, which was conducted by branch pipes to different parts of the town. At the different canal bridges there were reservoirs into which the pipes emptied. The water was obtained from a fine spring on the summit of the mountain Chapultepec."—(Bancroft's Native Races).

As a relief to these exaggerations we may take the testimony of some of the early writers. Peter Martyr says "that the trees were felled with copper and flint axes, and drawn upon rollers to their destination. Of nails they had none. They bored holes in beams and probably used wooden bolts. Sun-dried bricks were chiefly used in the dwellings, stone for the lower floor of the palaces. Lime was used for mortar. Roofs were covered with clay, straw and palm leaves. The houses were low and detached, each provided with a court and a garden. The streets were narrow. There were no vehicles; transportation was done by carriers. At intervals was a market place, with a fountain in the center, and a square filled with temples."

Boats do not seem to have served so important a part in Central America or in Peru, as in Mexico; for they were inland empires, or provinces, and depended more on the products of the soil and of the mines, and their chief feature consisted in their magnificent palaces and temples. Still there were boats along the coast which were even longer and more commodious than those which were seen upon the Great River. One of these was seen by Columbus on his second voyage and called forth his wonder.

The following is a description of one of these canoes.

"Columbus landed at Barracca, one of a group of Islands lying about thirty miles from the northern coast of Honduras. While he was on shore he beheld a canoe which had arrived from a distant voyage. He was struck with its magnitude and contents. It was eight feet wide, and as large as a galley, though formed of a trunk of a single tree. In the center was a kind of awning, or cabin of palm leaves, after the manner of the gondolas at Venice. Under this sat the cacique with his wife and children. Twenty-five Indians rowed the canoe, and it was filled with all kinds of articles of manufactured and natural production. Among various utensils and weapons similar to those already found among the natives he perceived others of a much superior kind. There were hatchets for cutting wood, formed of copper, wooden swords with sharpened flints firmly fixed in a groove, and fastened by cords made of the intestines of fishes. There were copper bells, and a rude crucible designed to melt the copper; various vessels and utensils made of clay, marble and of hard wood; sheets and mantles of cotton, worked and dyed with various colors, and great quantities of cocoa. Their provisions consisted of bread made from maize and roots of various kinds. The women wore mantles with which they wrapped themselves, and the men had cloths of cotton around their loins. They informed him that they had just arrived from a country rich, cultivated and industrious, situated in the west. They endeavored to impress him with the idea of the wealth and magnificence of the country from which they came."

2. As to the roads which existed in America in pre-historic times, very little is known. There were to be sure trails which connected the villages with one another. Some of them were used as thoroughfares, messengers were sent to and fro between the villages. In fact there was a perfect network of trails all over the territory contained in the Mississippi Valley, which for the time was as complicated and extensive as the network of railroads is at the present day. These trails, after the advent of the white man, became the routes which were followed by the emigrants from the seacoast to the interior, and became the high ways and public roads for the different states. The route that was taken by the French explorers in visiting the villages of the Iroquois was that of a trail, and it became the same route which the early settlers of Ohio followed when they were migrating. Another route led from the valley of the Schuylkill over the mountains by way of Wilkesbarre to the headwaters of the Alleghany River followed an old Indian trail, but it became the Wilderness Road which the settlers of Ohio took when they migrated from New England and the Atlantic coast. Another route led up the Potomac River to the headwaters of the Kenawha River, and down the river to the valley of the Ohio. This was however, the route which the

Indian tribes and the mound-building tribes took, in their migrating toward the Atlantic coast and the regions adjoining the Gulf of Mexico. The same route was followed by the Dakotas as they migrated from the region on the Atlantic to the Ohio Valley, and through the Ohio Valley to the prairies of the west. The army of De Soto followed a trail which led to the villages situated in the Gulf states, and finally reached the banks of the Mississippi River, and the region west of the river; in fact it was a trail which marked his route from beginning to end. It was a trail also that led Marquette to leave the little fleet of canoes beside the waters of the Great River, and to visit the village which was situated on the Des Moines River, when he was met by the chief who was so reverent in his manner and attitude. There are some hints, however, of more pretentious roadways than these slight trails. The historian of De Soto's party speaks of a wide roadway which



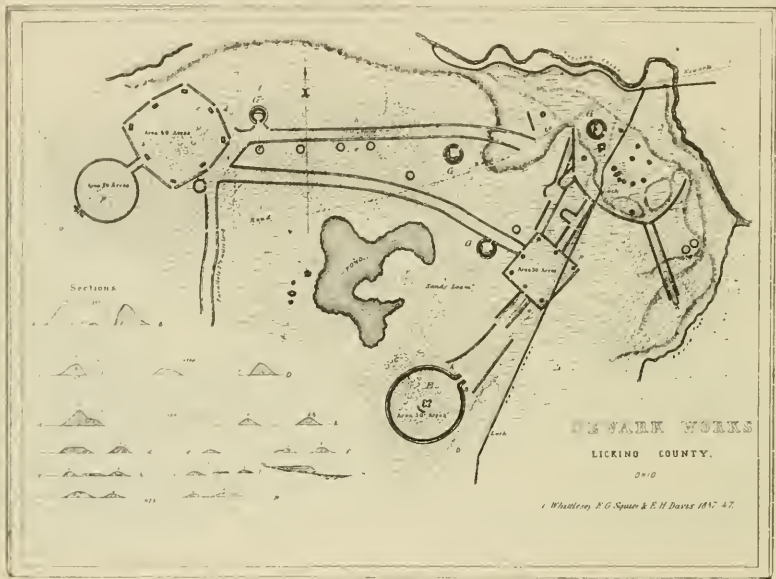
GRADED ROAD AT IRLINTON, OHIO.

led from the water's edge to one of the villages which the party visited, the remains of which have been identified in the earth walls, which are still standing. There are also graded roadways which led from the ancient villages of the mound-builders of the Ohio Valley to the water's edge which are still marked at the present day by double lines of earth-walls, making them among the most conspicuous of the mound-builder's works. though the manner of constructing such covered ways has always been a mystery. It may be that the earth-walls were designed to protect the people who dwelt in the villages from the attacks of wild tribes as they went to their fields or to the river's bank in large bands with their chiefs and ruling men at their head. These roads were at times attended with embankments which served for the landing

places of their canoes, and they suggest a picture of the times which corresponds with that given by the pyramid-mounds and village enclosures and temple-sites and dance-circles with which the region abounds.

We need only to imagine the fleets of canoes drawn up upon the water's edge, and the large bands of gaily decorated Indian warriors emerging from the village circles toward the river, ready to take their departure on some great expedition to neighboring villages, on some great festival occasion, to realize something of the social condition of the people of the time.

The "covered ways" which have been described as existing at Portsmouth and as having been used in processions in sac-

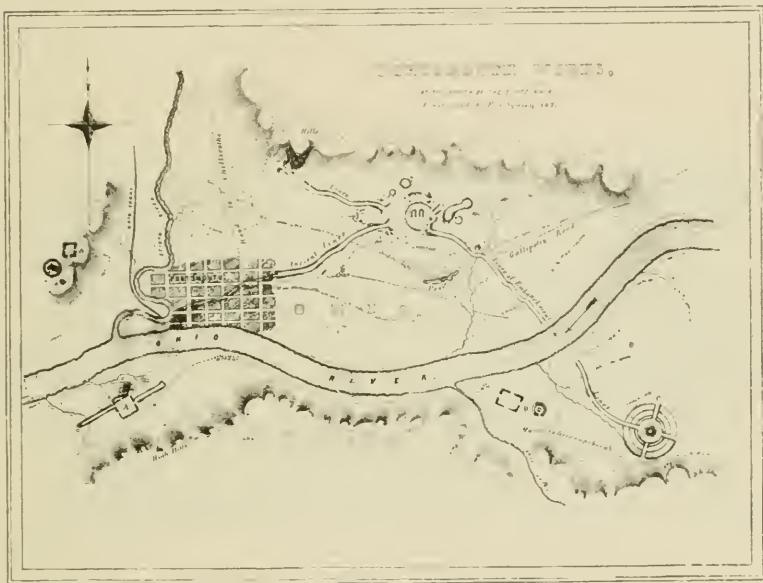


COVERED WAYS CONNECTING VILLAGE ENCLOSURES.

rificial ceremonies differed from those which connected village enclosures though they were protected in the same way by earthwalls. The best illustrations of roadways and graded ways may be found at Marietta, at Piketon, at Chillicothe and on Paint Creek in Southern Ohio, also in Highbank, on the Scioto River, and at Hopeton, in Ross County, also Newark, Licking County. There is also a covered way or avenue similiar to this at Mount Royal, in Georgia, which was formerly the Cherokee country. De Soto found such a broad roadway in Florida. Another illustration, however, of a roadway is found in Mexico; for here there was a road which ran from the city in each direction across the lake to the shore. This has already been described, but the best illustration is the one which was

situated at Teotihuacan, which was called the path of the Dead. It led from the great pyramid on which was a temple to the sun, between a series of pyramids for a distance of two miles, and was from two hundred to three hundred feet in width.

3. Mention should be made of the contrivances for securing water which were common in this country during the pre-historic age. It is well known that in Oriental countries it is one of the difficult problems, and a well, which contained drinking water was valuable enough for tribes to contend with one another to gain the control of them. The contentions between the servants of Jacob, who had dug a well, and the Canaanites is mentioned in the Scriptures as an important event. This point is also illustrated by many things on our own con-



COVERED WAYS LEADING TO SACRIFICIAL PLACE.

continent. In the first place, we may notice that the villages of the aborigines were always located near some stream, or in the absence of a stream, near some spring of living water. Even among the Pueblos of the far west, this was as common as among the tribes of the Mississippi Valley; for they were situated in an arid region, and the value of water was appreciated by them. A description has been given by certain explorers of that remarkable cavity in the rock called Montezuma Wells. Around this little body of pure water there were cliff-dwellings hidden amid the niches of the rocks, which were formerly occupied by a people who were agriculturists, and

cultivated the soil in the neighborhood, but made their home at this spot for the sake of the water. There are also many localities where cisterns and reservoirs were constructed on the Mesas, and the water, which fell from the clouds was carefully stored there. The City of Mexico was abundantly supplied with water from the lakes which abounded there, but it is one sign of the advancement of the people there that a fountain was constructed upon a distant mountain-top, and the water was conducted from it to the city, for the supply of the palace. The canals which formerly existed on this continent are also worthy of notice. These were far more artificial than the springs, or lakes, or wells, and for this reason have been oftener described.

4. The aqueducts of America are also worthy of mention in this connection. It is well known that there were aqueducts in Peru before the times of the conquest. These showed

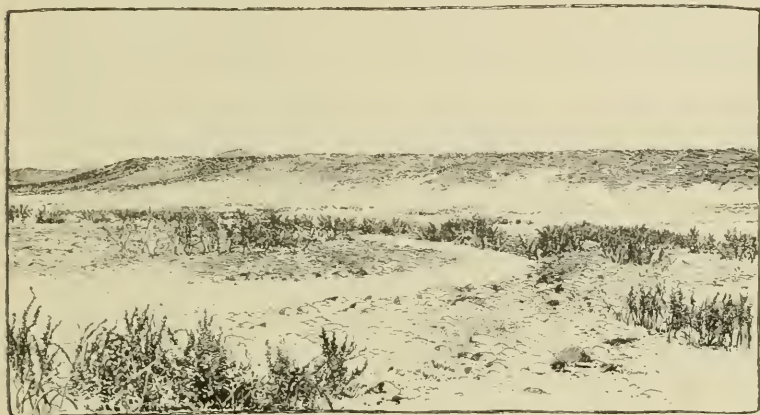


MONTEZUMA WELLS

much evidence of skilful engineering and mechanical construction. They supplied the cities with an abundance of water. They remind us of the reservoirs and aqueducts which supplied the City of Mexico with water before the time of Cortez' conquest. In Central America there was a scarcity of drinking water, and the natives were obliged to resort to the natural reservoirs, called "cenotes," which were contained in the caves with which that country abounds, but the rulers had extensive cisterns connected with the palaces, from which they gained their supply of water. These cisterns have been ransacked recently by Mr. H. C. Mercer, and many highly finished specimens of pottery have been recovered from them.

5. The canals which were constructed in America in pre-historic times are very interesting, perhaps as interesting as the

boats. There were a few canals in Florida the object of which is unknown, though they may have been designed to connect the waters of the ocean with the St. John River, or with the Lagoons between the two. There were also canals on the north west coast and on the California coast which connected some artificial harbors with the ocean at high tide. These, however, are insignificant when compared with those which formerly existed in the Interior, the most important of which were constructed by the Pueblos and the Cliff-dwellers. Descriptions of these have been published in the work on the Cliff-dwellers, and we shall therefore pass them by, merely referring to them as worthy of study. These canals were used for irrigating purposes, and were very useful, the most important one being that which was situated in the Verde Valley.



ANCIENT DITCH AROUND A KNOLL, CLEAR CREEK.

IRRIGATING CANAL IN ARIZONA

The age of this canal is unknown, but it is old enough to have been affected by the changes of nature, and antedated the deposit of alluvial soil. Reservoirs and convenient basins stored the water. The canal had several decided bends. The cut shows the ancient ditch, just where it turned southward and passed under the bluff. The plate shows where it passed the bluff, and turned toward the Verde River. Other canals have been described by F. H. Cushing, who says that they may be followed for many miles, and were wide enough and deep enough for the transportation of timber and even grain. They varied in width from ten to thirty feet, and in depth from three to twelve feet. Their banks were terraced in such a form as to secure a central current. The fall was about one foot to the mile. The ancients constructed great reservoirs to store the excessive water when the river was high, for conserving the waters of the sudden rains on the mountains and hills. The people built dams in the ravines, and large reservoirs in

the neighboring hills. From these reservoirs the waters were allowed to flow gradually over the fields.*

There were contrivances for storing water, for domestic purposes, which show the skill as well as the necessities of the cliff-dwellers. One of these shown in the plate, consisted in excavating a cistern in the rock, high up in the sides of the cliff, but near the cliff-houses, then making use of the ledge which led out toward the stream, and from that point drawing water out of the stream and filling the cistern with it, making use of some vessel and cord which resembled the bucket and rope of historic times, though they were made out of fibre and clay by the pre-historic people.

The canals of Mexico are fully as interesting as those of New Mexico. These have been described by the Spanish explorers and Mr. Bancroft has compiled their account in his interesting volume. The aqueducts and canals of Peru are worthy of attention. These have been described by E. G. Squier as follows:

"Even in these parts where the rain falls six month of the year, irrigation canals are used. The people economized every rood of ground by



CANAL AND RESERVOIR AT PECOS

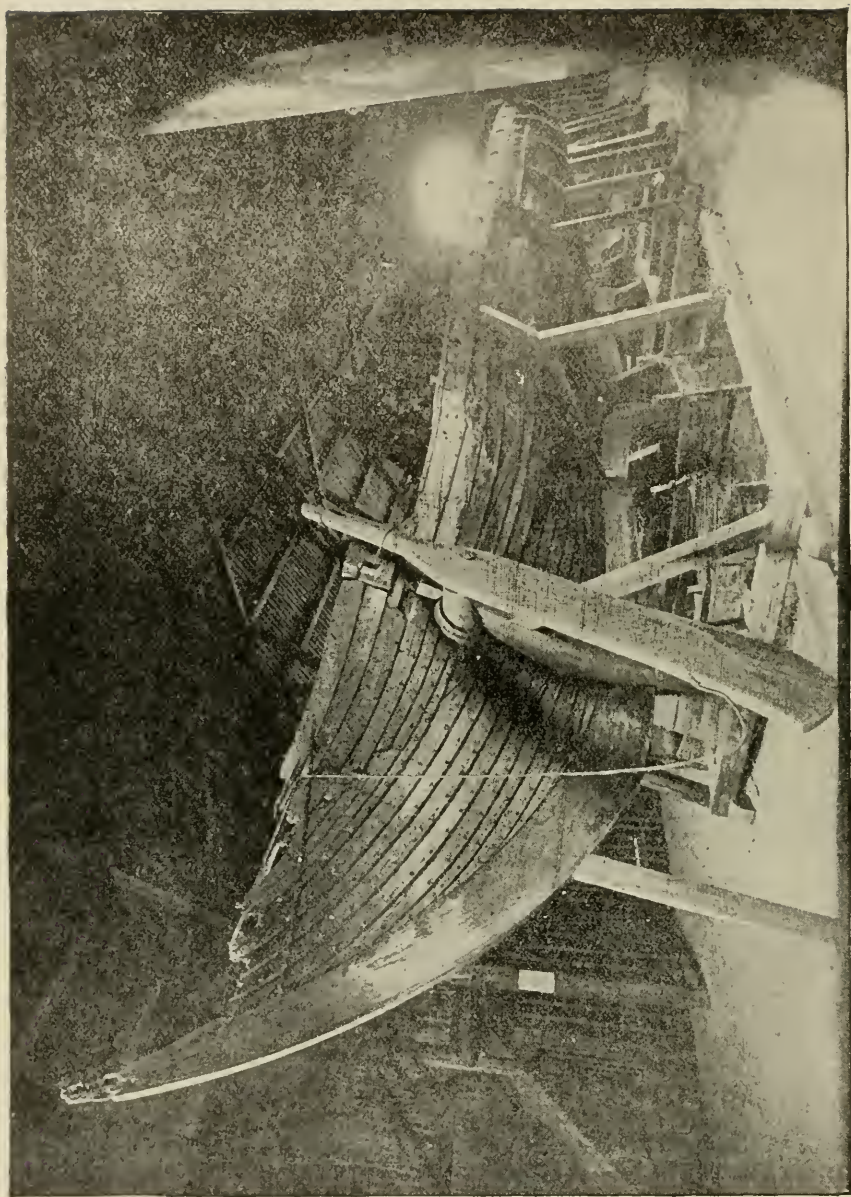
building their towns and habitations in places unfit for cultivation, but they terraced the hillsides and mountains, and led the mountain springs and torrents downwards until they were lost in the valley. These acequias are of great length, extending in some places hundreds of miles, sustained by high

walls of masonry, cut in the living rock, and in some cases conducted in tunnels through the sharp spurs of the mountains. It is on the desert Pacific coast of Peru that we find the most extensive works. They not only constructed dams at different elevations, with side weirs to deflect the water over the higher slopes of the valley, but they built enormous reservoirs high up among the mountains, as well as down nearer the sea. One of these reservoirs in the valley of the Nepena is three-quarters of a mile long, half a mile broad, and consists of a massive dam of stone, eighty feet thick at the base, and carried across a gorge between two lofty hills. It was supplied by canals, one starting fourteen miles up the valley, and the other from a living spring five miles distant. The Bath of the Incas and seats cut in the rock, the famous lake and islands in the lake, are features which render the city of Titicaca very famous. Here was a palace which stood on an artificial terrace, while the steep hill bends around it in a half-moon, in graceful curves, also terraced. The Inca's Chair is also a remarkable curiosity. Here a mass of sandstone one hundred feet long, twenty feet high, contained on its summit a chair which was cut out of the solid rock with steps or seats also cut out of the rock leading to it on both sides."

There are many other contrivances throughout the arid regions for conveying and storing water, and for irrigating the soil, and even in supplying the villages with water—(see cut.)



CANOE FOUND IN A PEAT BOG.

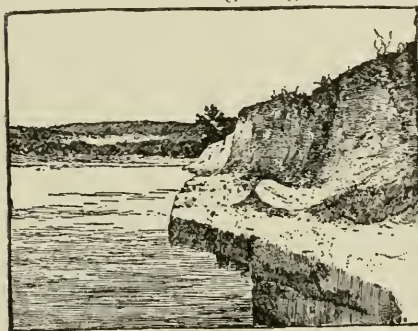


ANCIENT EGYPTIAN BOAT.

The study of the various constructions which were used for the distribution of water, and for the conveyance of freight, and for travelling on this continent, as compared with those common in Oriental countries, is very instructive.

These contrivances were more abundant in the arid regions, where the pueblos and cliff dwellers had their home, but they were also common in Mexico, Central America, and Peru, and were used for domestic purposes, and for the supply of fountains and gardens, for fields, and other purposes. Canals were built by the Pueblo tribes and extended from ten to eighty miles, and were used both for irrigating and transporting timber and logs to the villages. Here the villages were at times placed at the end of canals, but in other places they were scattered along the sides of the canals or acequias.

There were in the valley of the Gila and Salado acequias, along which continuous villages were scattered which drew the water from them for irrigating the soil, some of which remain to the



PUEBLO CANAL.

present time. The ancient culture which flourished in these villages is shown by the ruins of the *Great Houses*, bordered on both sides by ample fields and gardens, which were irrigated by canals which conveyed water from the streams. There is no doubt that the degree of civilization reached by the Pueblos was owing to the fact that permanent villages were established along these canals,

and the irrigating of the soil gave subsistence to the people, notwithstanding the arid climate that prevailed.

Irrigating ditches are still in use in New Mexico and Sonora, but ancient ditches are sometimes found several feet below these. Garden beds are very common in these regions. These garden beds were sometimes on the sides of bluffs, the face of which had been converted into terraces. There are creeks and streams far southwest among the Sierra Madre mountains, with stone terraces built across small valleys, which resemble staircases. This region was occupied by a tribe of cave dwellers, who built great cylindrical store-houses, in which they stored grain which was raised in the valleys.

Mr. Carl Lumholtz says:

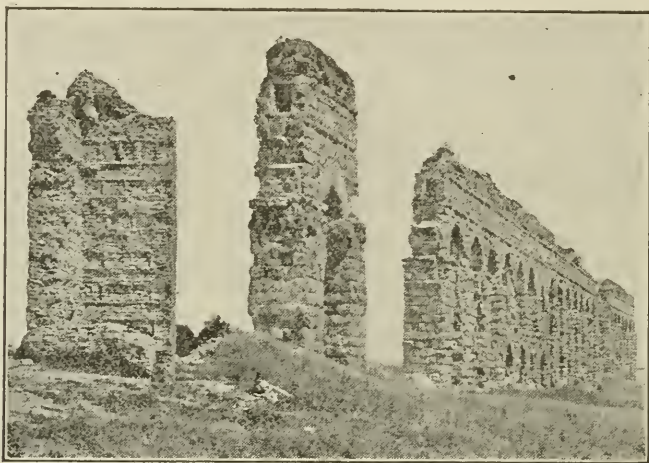
"On the table lands and hills are to be seen ancient ruins of extensive villages: rough cyclopæan walls of small houses built close together; while on the broad flat river banks below, there are large areas with a network of low stone dikes for spreading the water of the arroyos when irrigating the ancient garden fields. Arrow heads of obsidian, pieces of pottery and mill stones; were found near these pueblos. Earlier than the Apaches

there lived in these woodlands other Indians of an agricultural house-building race, now extinct. Most of the ancient pueblos are found on the ridges of the very mountain crests, with commanding views of the surroundings. On the steep mountain slopes there are astonishing numbers of small terraces looking like giant steps, built one above the other, which were used for ancient garden beds, and were formed by a simple wall of boulders from 6 to 20 feet high. The most remarkable structures were the cupola-shaped jars which were found among the cave dwellings and served the purpose of storing corn."

There were also in Central America cenotes or underground wells around which many of the ancient cities were erected. These cenotes were natural ponds which were surrounded by the rocks, and were reached by paths or stairways.

M. D. Charnay has described two such wells or cenotes at Chichen-Itza. He says:

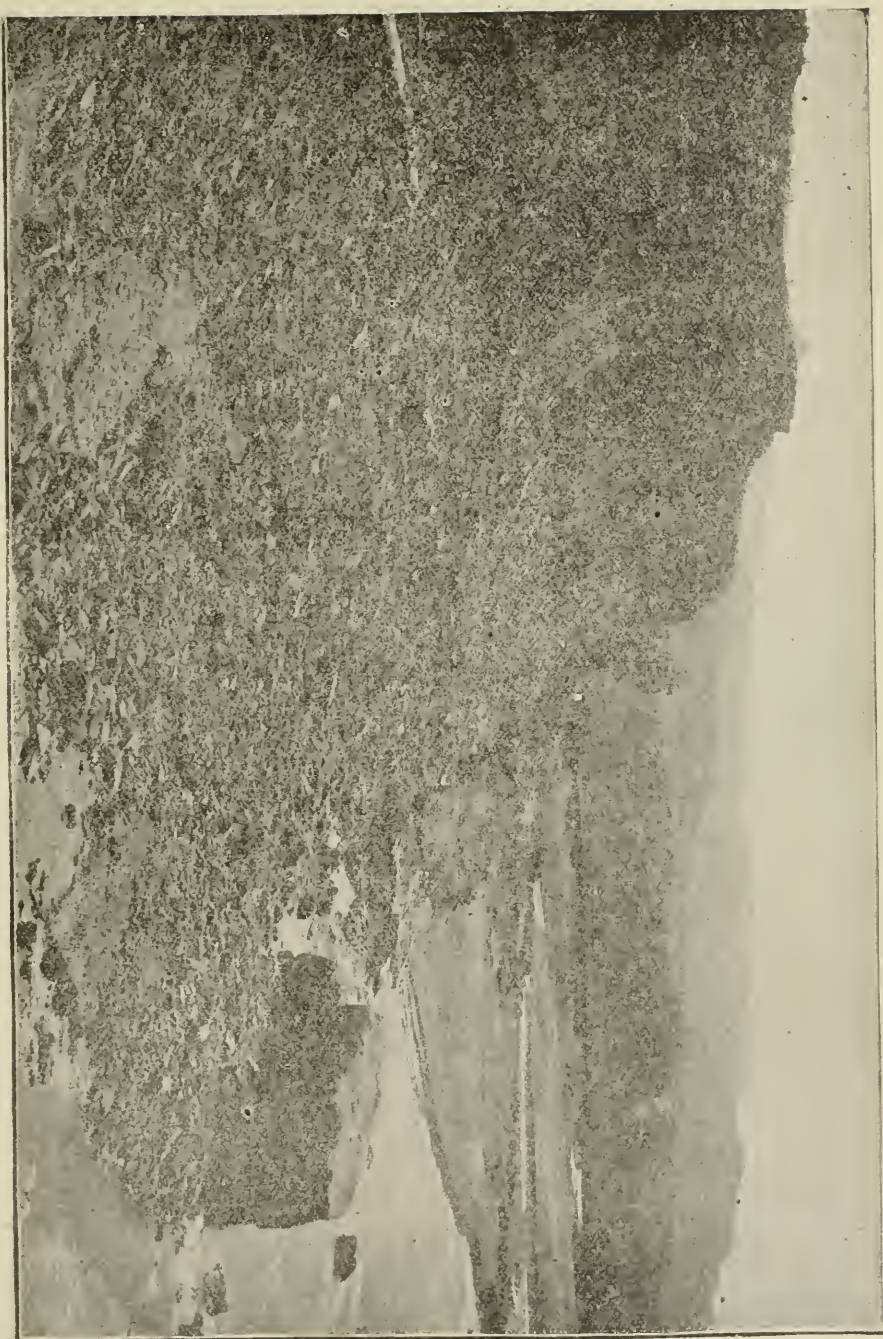
"The situation of Chichen is due probably to the great cenotes which

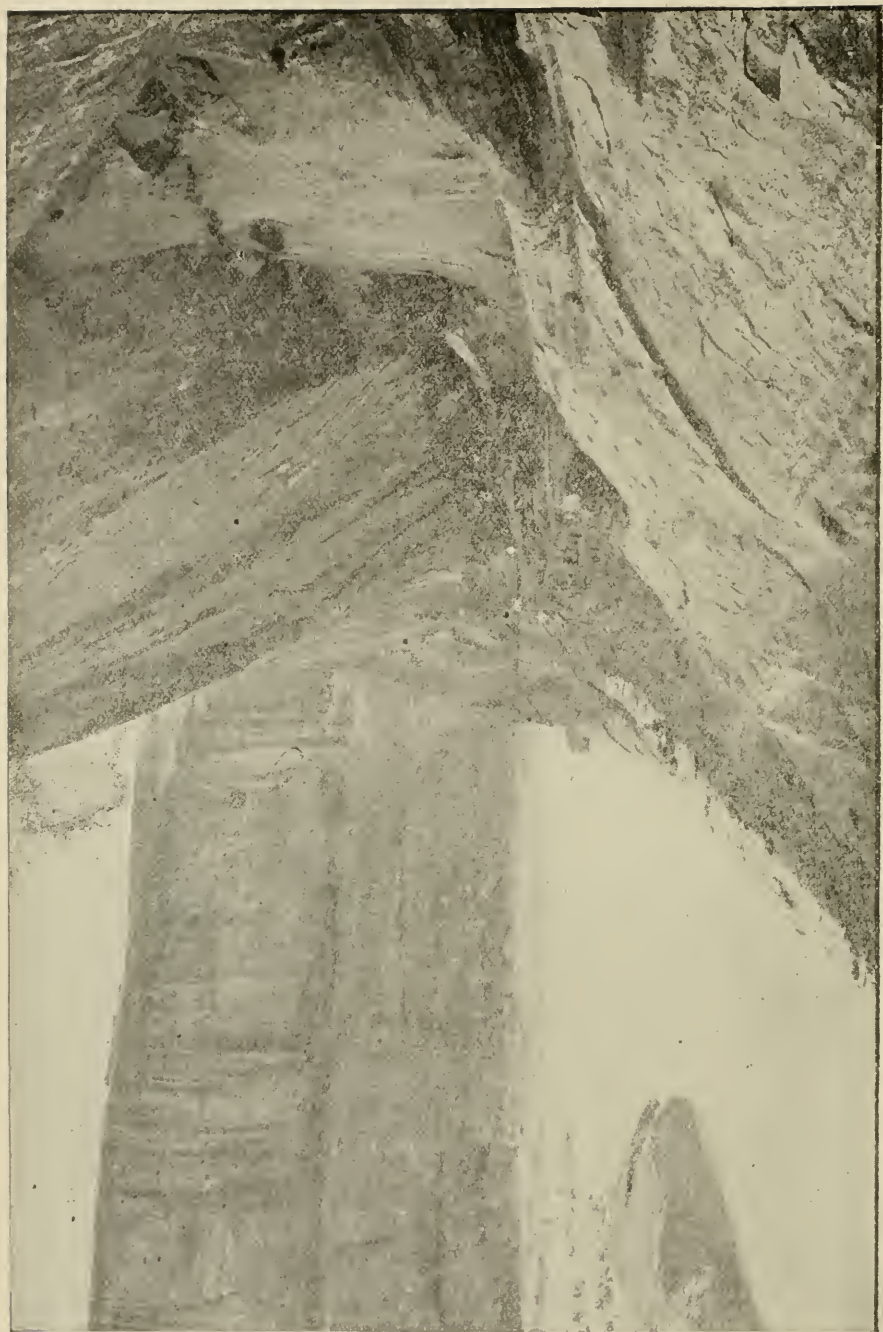


AQUEDUCT AT SEGOVIA.

supplied the city with abundant water, and which differ from the underground passages noted in other parts of the State, being great natural pits of great depth with perpendicular sides. The Sacred Cenote is oblong in shape, and measures from 130 to 165 feet; the walls 65 feet high, and is perpendicular throughout. Hither pilgrims repaired and offerings were made, for Chichen was a holy city, and among her shrines the cenote held a conspicuous place, as the following passage from Landa will show. 'From the courtyard of the theatre a good wide road led to a well some little distance beyond, into which in times of drought the natives used to throw men as an offering to their deities. I also found sculptured lions, which, from the manner in which they were fashioned, must have been wrought with metal instruments; besides two statues of considerable size with peculiar head, earrings and the mantle around their loins.' The statue of Tlaloc, who was the god of water, was found at Chichen-Itza, showing that it was a sacred place because of the abundance of water. This statue has carved on the surface, aquatic plants, and two frogs and a fish. This represents a man lying on his back, his legs drawn up, and his feet on the ground, and holding in both hands a vase."

ANCIENT CANALS IN ARIZONA.





RESERVOIR USED BY THE CLIFF DWELLERS.

There were in America, fountains and aqueducts which attracted the attention of the early discoverers, some of which have been described by the early explorers. These aqueducts did not equal those which were so common in ancient historic lands, yet a comparison between the two, will reveal to us the social status of the prehistoric people. Strabo said the Romans built great aqueducts in their provinces. That of Metz in Belgic Gaul, is among the most remarkable. The aqueducts on the Island of Mitylene, of Antioch, of Segovia of Spain, and of Constantinople, are to be mentioned. The cut represents the aqueduct of Segovia, and shows the manner in which such structures were erected by the Romans.

The following is a description of the aqueducts in Mexico:

"Water was brought over hill and dale to the top of the mountain, by means of a solid stone aqueduct. Here it was received in a large basin, having in its center a great rock, upon which were inscribed in a circle the



WATER BASIN IN MEXICO.

hieroglyphics representing the years that had elapsed since Nezahualcoyotl's birth, with a list of his most noteworthy achievements. * * *

From this basin the water was distributed through the garden in two streams, one of which meandered down the northern side of the hill, and the other down the southern side. There were likewise several towers or columns of stone having their capitals made in the shape of a pot from which protrude plumes of feathers, which signified the name of the place. Lower down, was the colossal figure of a winged beast called by Ixtlilxochetl, a lion lying down, with its face toward the east, and having in its mouth a sculptured portrait of the king; this statue was generally covered with a canopy adorned with gold and feather work.

A little lower yet there were three basins of water, emblematic of the great lake, and on the borders of the middle one three female figures were sculptured on the solid rock, representing the heads of the confederated states of Mexico, Tezcuco and Tlacopan.

Upon the northern side of the hill was another pond; and here upon the rock was carved the Coat of Arms of the city of Tulan, which was formerly the chief town of the Toltecs. Upon the southern slope of the hill was yet another pond, bearing the coat of arms and the name of the city of Tenayuca, which was formerly the head town of the Chichimecs. From this basin a stream of water flowed continually over the precipice, and being dashed into spray upon the rocks, was scattered like rain over a garden of

odororous tropical plants. In the garden were two baths, dug out of one large piece of porphyry, and a flight of steps also cut from the solid rock; worked and polished so smooth that they looked like mirrors, and on the front of the stairs, were carved the years, months, day, and hour in which information was brought to King Nezahualcoyotl of the death of a certain lord of Huexotzinco, whom he esteemed very highly, and who died while the said staircase was being built. The garden is said to have been a perfect little paradise. The gorgeous flowers were all transplanted from the distant terra caliente; marble pavillions, supported on slender columns, with tessellated pavements and sparkling fountains, nestled among the shady groves and afforded a cool retreat during the long summer days. At the end of the garden, almost hidden by the groups of gigantic cedars and cypresses that surrounded it, was the royal palace, so situated that while its spacious halls were filled with the sensuous odors of the tropics, blown in from the gardens, it remained sheltered from the heat."

"Montezuma's Baths" have also been spoken of. These were situated upon the mountain top, and were surrounded by seats which probably resembled those of the Incas in Peru. In connection with them there was an aqueduct that led across the valley.

The following is a description from Bancroft:

"About three miles eastward from Tezcuco is the isolated rocky hill which rises with steep slopes in conical form to the height of perhaps 600 feet above the plain, a portion on the side of the hill is graded very much as if intended for a modern railroad, forming a level terrace with an embankment from 60 to 200 feet high connecting the hill with another, three quarters of a mile distant, and then extends toward the mountain ten or fifteen miles distant, the object of which was to support an aqueduct or pipe ten inches in diameter, made of baked clay or blocks of porphyry. At the termination of the aqueduct on the eastern slope of Tezcocingo is a basin hewn from the living rock of reddish porphyry, known as "Montezuma's Bath," four feet and a-half in diameter, and three feet deep, which received water from the aqueduct, with seats cut in the rock near it."

Several persons have described this aqueduct, among them Brantz Mayer, and Edward Tylor, who have spoken of the perfection of the work. The seats which adjoined it have also been described by Col. Mayer, as follows:

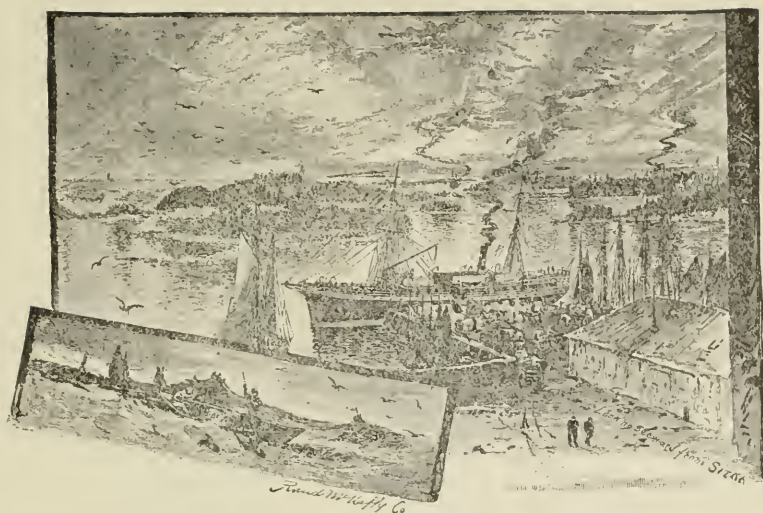
"The picturesque view from this spot over small plains, set in the frame of the surrounding mountains and glens which border the eastern side of Tezcocingo, undoubtedly made this recess a resort for royal personages for whom these costly works were made. From the surrounding seats they enjoyed a delicious prospect over this lovely but secluded scenery, while in the basin at their feet were gathered the waters of the spring. On the northern slope is another recess bordered by seats cut in the living rock, and traces of a spiral road and a second circular bath, and sculptured blocks on the summit."

Bancroft speaks of the ruins of a large building, a palace whose walls still remain eight feet high, and says that the whole mountain had been covered with palaces, temples, baths, and hanging gardens.

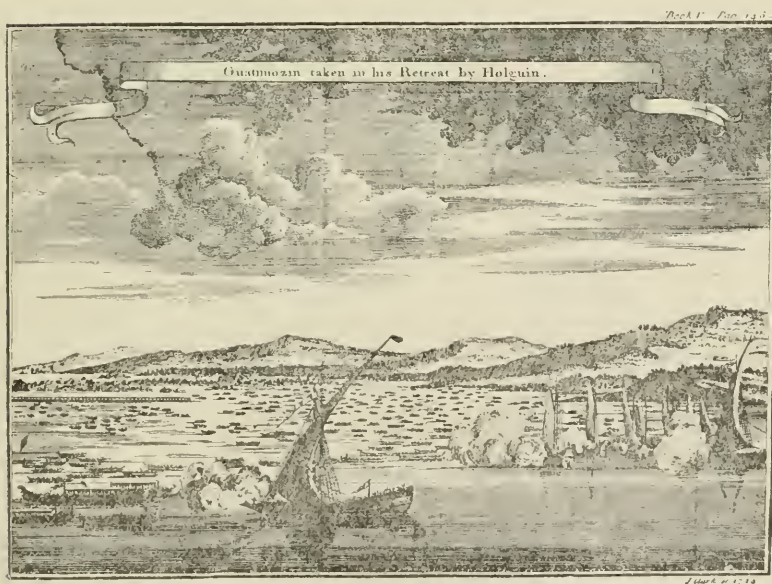
There were also other aqueducts which supplied the gardens and fed the fountains which so beautified the various cities. These have been described by the Spanish writers.

Peter Martyr, describing the Palace at Iztapalapan, writes:

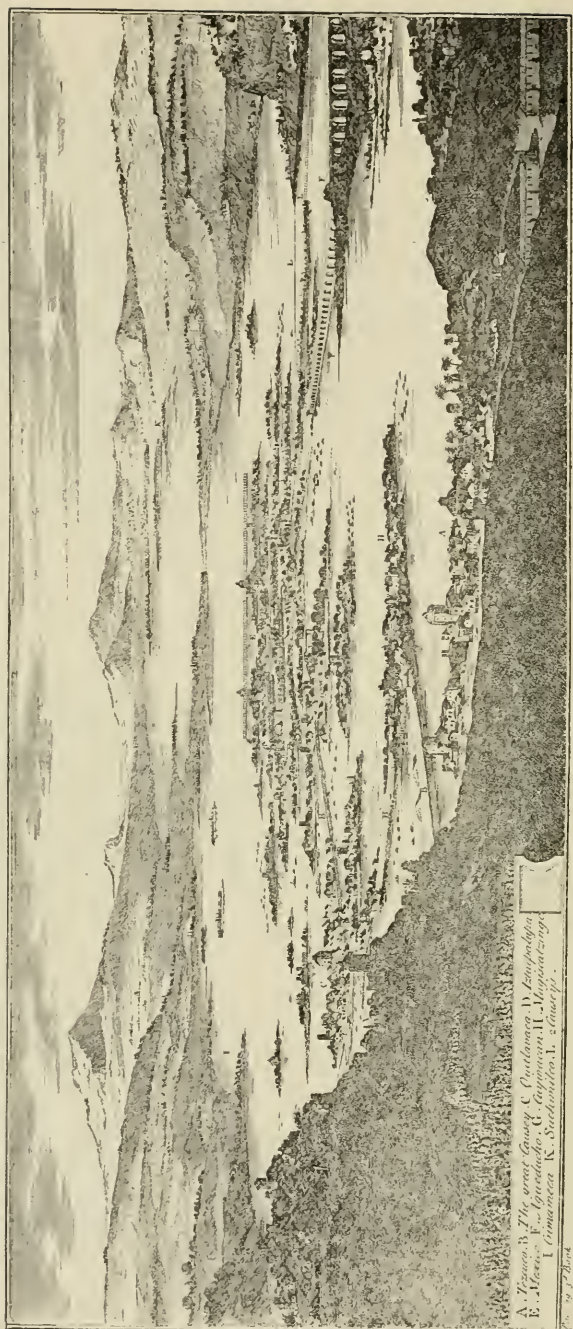
"That house also had orchards, finely planted with divers trees, and herbs, and flourishing flowers, of a sweet smell. There are also in the same great standing pools of water with many kinds of fish, in which divers kind



NATIVE BOATS AND MODERN STEAMER IN SITKA.



MEXICAN BOATS AND SPANISH BRIGANTINES.



ROADS AND BRIDGES AND ANCIENT CITIES DESCRIBED BY DE SOTIS.

A. Tzucos, B. The great Quay, C. Chulucance, D. Amoyacaban,
E. Mexico, F. Apedacocho, G. Apoyacan, H. Miquilatzuc,
I. Cimaameca, K. Suchonulco, L. Amoyacaban.

of all sorts of waterfowl are swimming. To the bottom of these lakes a man may descend by marble steps brought far off. They report strange things a walke inclosed with nettings of canes, lest any one should freely come within the voyde plattes of ground, or to the fruits of the trees. Those hedges are made with a thousand pleasant devises, as it falleth out in those delicate purple crosse alleyes, of myrh rosemary or boxe, al very delightful to behold."

The roads and bridges which formerly existed in Mexico, Central America and Peru are also worthy of attention. These roads were used mainly for the passage of armies.

Many ancient writers have described the towns which were scattered through the province of Mexico and the roads that led to them. The towns extended over a comparatively large surface, owing to the fact that the houses were low and detached, and each provided with a court and garden. The larger cities seem to have been laid out on a regular plan, but the streets were narrow. Indeed there was no need of wider ones as all transportation was done by carriers, and there were no vehicles. At intervals a market place with a fountain in the center, a square filled with temples or a line of shady trees relieved the monotony of the long rows of low houses.

De Solis has described the cities which were situated in the midst of the lake,* and the causeways which connected them, and its bridges and towns, and the appearance of Montezuma, the king, when he came forth in his palanquin to meet Cortes. He says:

"Tezcuco was, in those days, one of the greatest cities of that empire. The principal front of the buildings was extended upon the borders of a spacious lake in a delightful situation, where the causeway of Mexico began. In this part, the causeway was about twenty feet broad, made of stone and lime, with some works on the surface. In the middle of the way, there was another town of about 2,000 houses called Quitlavaca; and, because it was founded in the waters they called it Venezuela, or little Venice. From this place he discovered the largest part of the lake and various towns and causeways. The towers, adorned by pinnacles, seemed to swim upon the waters, with trees and gardens out of their proper element; besides a multitude of Indians, who were approaching in their canoes to behold the Spaniards; and much greater was the number of those who showed themselves on the battlements of the houses, and in the most distant galleries; a sight extremely beautiful, and a novelty surprising beyond imagination. The next morning they found themselves upon the same causeway, being in that part wide enough for eight horses to march in front. The army consisted then of about 450 Spaniards, 6,000 Indians, Tlascalans, Zempoalans, and other confederates. They continued their march to the city of Iztacpalapa, a place far exceeding the rest in the height of its towers and manner of building; the city consisted of nearly 10,000 houses, two and three stories high, part of which are built upon the lake, and stretched along the shores. * * * The lodging of the Spaniards was prepared in the Prince's own palace, where they were all under cover: The palace was large, and well built, with distinct apartments both above and below; among which were many chambers whose roofs were flat, and of cedar. There were in Iztacpalapa many fountains of sweet and wholesome water, conveyed by several aqueducts from the neighboring mountains, through a great number of gardens, large and well cultivated. In the middle of the garden was a pond of fresh water, encompassed with a wall of quadrangular form made

*The plate and cuts represent the roads and bridges which the Spaniard saw on the Lake of Mexico, but the artist seems to have taken his pattern from European rather than native American models.

of stone and lime, with stairs on all sides to the bottom. It was so large that each side contained 400 paces, a work well worthy of a prince. * * * They had two leagues of causeway hence to Mexico, and took the morning before them. He continued his march in the accustomed order, and leaving in the one side the city of Magiscatzingo, situated on the water, and on the other that of Cuyocan, upon the causeway, besides a great many towns, which they saw at a distance upon the lake; they discovered as soon as they drew somewhat nearer (and not without admiration) the great city of Mexico, elevated to a vast degree above all the rest, and carrying an air of dominion in the pride of her buildings. They had marched little less than half way, when they were met by more than four thousand nobles and officers of the city, who came to receive them, and whose compliments delayed their march a considerable time, though they only paid their obeysance and then advanced before the troops toward Mexico. In the march, a little before the city was a bulwark of stone, with



MONTEZUMA MEETING CORTES.

two small castles on the sides, which took up all the causeway; the gates opened upon another part of the causeway, terminated by a drawbridge which defended the entrance of the city with a second fortification.

As soon as the nobles who accompanied them had passed to the other side of the bridge, they made a lane, for the army to march, falling back on each side, and then there appeared a very large and spacious street, with great houses uniformly built; the windows and battlements were full of spectators, but the street entirely empty. And they informed Cortes that it was so ordered, because Montezuma resolved to receive him in person, in order to distinguish him by a particular mark of favor; a little after which Cortes saw the first troop of the royal retinue; which consisted of about two hundred noblemen of Montezuma's family, clothed in one livery, with great plumes and feathers, alike in fashion and color.

Then there appeared a larger company, better dressed and of greater

dignity, in the midst of which was Montezuma, carried upon the shoulders of his favorites in a chair of burnished gold, which glittered through the various works of feathers, placed in handsome proportion about it, which in some measure seemed to out vie the cost of the metal. Four persons of great distinction followed his chair, holding over him a canopy made of interwoven green feathers, so put together that they formed a kind of web, with some ornaments of silver. For his apparel Montezuma wore a mantle of the finest cotton, tied carelessly on his shoulders, covering the greatest part of his body, with the end trailing on the ground adorned with different jewels of gold, pearls and precious stones. His crown was a mitre of gold. On his feet he wore shoes of hammered gold, whose straps studded with the same bound them to his feet, and came round part of his leg like the Roman military sandals."*

Here then we have a description of the great chief Montezuma, and the manner in which he was carried by his attendants and his dress and general appearance. It was no doubt a great surprise to the Spaniards to meet such royal magnificence, especially in the midst of these strange scenes, and yet the description given by those who attended De Soto in his famous expedition through the Gulf States shows that even there, the same method of carrying their chief and the same custom of adorning his form with gay feathers and gorgeous apparel was common among the native tribes of that region. The scene however carries us back to the times of ancient history, to the lands of the East, and bring before us both contrasts and resemblances which are very instructive. We read about the ancient conquerors who marched at the head of a large army, from Babylonia across the deserts to the land of the Jordan and the sea, and even invaded Egypt; and we are made familiar with the chariots and horses by the monuments which represent them. The Egyptian kings have left the record of their conquests on the rocks, and have portrayed their warriors as riding in chariots and gaining great victories. There are no such scenes in America, for while the monarchs commanded great armies, yet they were armies which fought their battles on foot, and had for their weapons the arrows and spears which are made of stone, and scimitars which were furnished with teeth or sharp points. The only conveyances were those which were borne on the shoulders of men, and in which the monarchs rode in state when they were to appear before the people.

Now we may say of all of these contrivances which we have described as so common in America in pre-historic times that they were very insignificant when compared with those which prevailed in the lands of the East after the days of history had begun. If we take each one in their turn and draw the contrast, we shall see that the stage of society which prevailed in America was far less advanced than it was in the East when history opened. Nevertheless, there is a lesson coming to us from this view. We learn from these, what kind of constructions prevailed in historic countries before history began, and

have a picture of primitive society as it once existed in the far East.

It will be remembered that there was a canal in Egypt at an early date which connected the Nile with the Red Sea. There were also canals which covered the plain of Babylon with a network, and made it seem like a paradise. There were gardens also which were built in the City of Babylon, so high above the walls as to seem to be hanging above the walls, and so were called "hanging gardens." There were roads which traversed the desert between Babylonia and Egypt, over which conquerors often passed in their chariots, others which connected the cities of Greece with one another, and gateways out of which chariots passed on their way to conquests. There were also paved roads which were built during the time of the Roman Empire, remains of which are still to be seen. There were aqueducts which served to carry the water from great distances to the cities in ancient times, the remains of which are found at the present day in Jerusalem, in Rome, and the cities of Spain.

There were roads in China at an early date, remains of which are still existing, though they are sadly neglected, and at present most uncomfortable to ride over. Mr. Arthur Smith has described them, and states that the pavements have been so torn up and the stones removed that the roads themselves are scarcely more than ditches which pass through the fields, and are often filled with water. The traveller who passes over the roads, finds himself plunging from pavements into mud-holes and out again, even at the risk of his life.

The great canal of China has been the chief thoroughfare of that country for many hundred years, and is still crowded with boats of all kinds. Travellers speak of these boats as constituting the homes of a vast multitude of people and as fitted up not merely for transportation but as permanent places of abode. There are however many boats in the Phillipine Islands which are as rude as those of China or aboriginal America, yet they represent the different forms which prevailed in prehistoric and early historic times, and furnish very suggestive objects of study.



BOATS AND VESSELS OF THE PHILLIPINES.



BOATS AND CANALS IN CHINA.



The Grand Canal, near Shanghai.



Foo Chow, China, with a population of one million, thousands of whom live in house-boats.

CHAPTER VII.

COAST AND MARITIME STRUCTURES.

THE view which we have given of the prehistoric structures shows that the world had become quite thoroughly peopled before the discovery of this continent. The means by which this was accomplished and the lines which were followed are not by any means certain, but the supposition is that the people who first dwelt in caves amid the mountains, afterward went down into the valleys, and became agriculturalists; and still later reached the sea coast, and gradually made their way along the coasts, until all the continents were reached.

It will be interesting, then, to take such structures as are found upon the sea coast and the islands for special objects of study, and see if they throw any light upon the subject of migrations. These structures may, indeed, carry us back to those which were left many thousand years ago on the coast of Europe; but the comparison may, perhaps, enable us to trace the lines of progress which were followed and the means by which civilization was spread over the globe.

We shall, therefore, take these various works as our subject, and shall classify them under the general head of Coast and Maritime structures, embracing all kitchen middens, lake-dwellings, pile-dwellings, crannogs, shell keys, and all structures built over the water.

Some of the structures were, to be sure, placed near the fresh water lakes and are hardly to be included under the term "maritime," and yet they may be all classed together and treated as if they constituted one type. The people who have left these various tokens are better known under the name of Lake-Dwellers, than by the name we have given, but they represent only a small part of the population which has at different periods, both in historic and prehistoric times, occupied the lake shores and sea coasts, and drawn their subsistence from the water. The terms have come to us from the archæologists, and are used chiefly by them, but are generally applied to prehistoric structures, some of which are regarded as the earliest tokens of prehistoric man.

There are, to be sure, maritime structures and pile-dwellings which are quite modern in their origin and are still occupied. These, for the most part, are found in the islands of the sea; some of them in the Philippine Islands, the Caroline Islands, the Caribs, and in Java and New Guinea. Still, the three classes of structures—shell mounds, pile-dwellings, and maritime structures—may be said to fill up the whole gap between the cave period and the historic period, though there were many other structures contemporaneous with them.

By taking the maritime structures which are still in existence, and by studying them altogether, we are able to ascertain what the condition of society was in prehistoric times. We must remember that all three classes of works were once peopled by those who were exercising their skill in making for themselves comfortable habitations, and were laying the foundations of society for the future. A large proportion of the people who have left these various monuments have passed away and are unknown, except as we are able to study their works and relics; but those who built the maritime structures have their representatives still living, and from these we may learn their habits, ways, and customs of the Lake-Dwellers and other prehistoric peoples. There is not the same mystery about the living people as there is about those who existed several thousand years ago; yet so far as the growth of architecture is concerned or the spread of population through the earth, these rude structures, which, for the most part, were built by sea-faring people, are as instructive as any monuments which exist.

Of one thing we may be sure: namely, that these so-called lake-dwellings and various maritime structures were occupied by a sedentary people and were erected for domestic purposes; while of many of the stone monuments it is still a mystery as to what their object or use was. There may have been, indeed, other works, such as the so-called Pit-houses in Japan, which were occupied by the Ainu or their ancestors, but these are not of general distribution.

The three classes of works illustrate one point: namely, the effect of environment upon the habits of the people. It would seem that, as long as the people were dwelling in the forest, they continued in the low condition of savagery; but, as soon as they came into the open plain, they commenced their onward march toward civilization. Their progress was hastened as they approached the sea and made their homes on the sea coast. There was undoubtedly an expanding influence in the very sight of the sea and a development of the consciousness of power, when man began to be a navigator of the sea. The narrow character of forest tribes, or even of mountain people, is well known, for the limitations of their surroundings have an inevitable effect to shut them in and keep them back. It will be interesting, then, to enter into the study of these maritime constructions, and show their position among the prehistoric

NOTE.—The Plate represents two mounds at Pany's Bayou on Old Tampa Bay. Figure 1 is an oval-shaped mound, about five feet high, into which a ditch about two feet deep and fifteen feet wide runs. At the opposite end is a roadway which may be followed several hundred yards into the hammock. Fig. 2 is a section across the mound, looking down into the ditch. Fig. 1c represents the roadway leading to the mound. Another mound, 200 feet long, twenty-nine feet high, and thirty feet wide on the top, with a beautiful incline roadway leading up its western side: it is situated at Bethel's Camp. Figs. 3 and 4 will give an idea of its ground plan, its elevation, and the incline plane or roadway to its summit. Another mound with a roadway to its summit is situated at Dunedin; there were around this mound, deep ditches filled with water, and at a distance ponds and a marsh. The mound is nine feet high, fifty-six feet in length, and eighty feet wide: and the roadway commences fifty feet from the mound, and makes a gentle rise to the top of the main structure. See, for description of other mounds and for maps, Smithsonian Report for 1879, page 394; article by S. T. Walker.

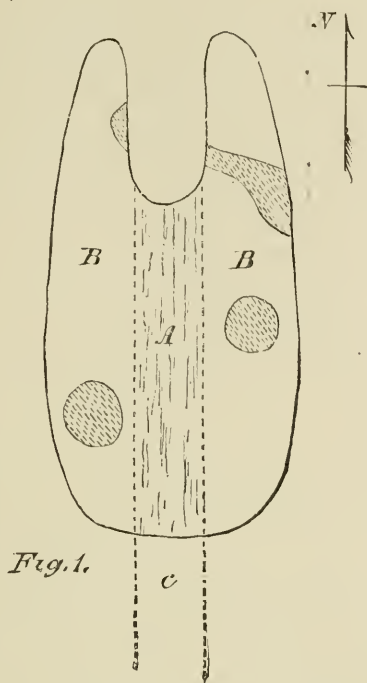


Fig. 2.

Mound
— at —
PAPY'S BAYOU

Note. The Shaded portions indicate explorations.

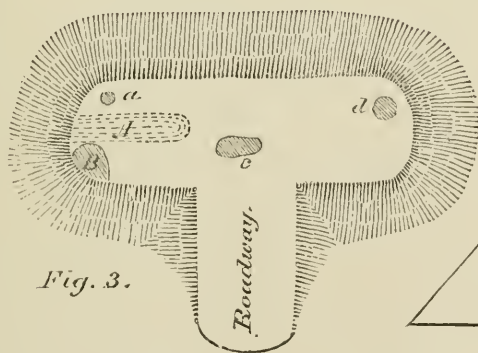


Fig. 3.



Fig. 4.



works and their bearing upon historic times. We do not claim for them any architectural character, for they are generally rude constructions destitute of all ornament and hardly presenting even the elements of art. Nor do we, on the other hand, class them with the earliest historic dwellings, for there were rude dwellings long after there were kitchen middens, and it is probable that the huts which were erected by hunter tribes upon the land, may have continued to be occupied long after the shell heaps by the sea. These huts, however, which were hidden in the forest, were built of unsubstantial material and soon perished. But those which were built by the sea were surrounded by the heaps of shell, which are very enduring, and the result is, the latter are preserved for our examination, while the former have passed away.

The distribution of the kitchen middens, lake-dwellings, and various maritime structures, has given us a good opportunity for examining them, especially as there are structures resembling them still occupied, and from them we may learn the stage of society which was then represented. Still, it would be well to remember that what is ancient in one country is modern in another, and that the same structures which have been discovered on the coast of America in recent times, existed in Europe and Asia several thousand years ago. It may be said of all these structures, especially of those upon the sea coast, that they help us to trace the line of migration which was taken by the early inhabitants of the world, and throw considerable light upon the distribution of mankind throughout the world.

Prof. O. T. Mason has spoken of the quest for food as being one cause for the distribution of the population throughout the globe. He has traced the migrating route which a sea-faring people may have taken, when passing from the islands of the Pacific, along the east coast of Asia and by way of the Aleutian Islands finally reaching the Northwest coast. The monuments which indicate their route, or the route taken by subsequent people, may be recognized in the dolmens which are found in India, Japan, and Peru. The kitchen middens evidently preceded these, though it is a question whether they were left by a migratory people, or by a people who came down from the interior and made their homes on the sea coast.

Prof. Worsaae has also spoken of the migrations which took place in Europe. He says:

In the first settlement of Europe the fringe of coasts and nearest river courses had everywhere played a leading part. So long as hunting and fishing formed the most important resources of the settlers and vast stretches of coast were still untrod by human foot, the primeval inhabitants, unaccompanied by any domestic animal save the dog, would have no great difficulty in spreading further, or flitting from place to place, when they began to be pinched for food. A very long time must have elapsed ere the more highly developed races, steadily advancing from south and west, were in a condition—as lake-dwellings, stone graves, and other memorials show—to spread from the Mediterranean coasts over Switzer-

land, part of South Germany, the whole of France, Belgium, Holland, the British Isles, and Northwestern Germany. The last period of the Stone Age in the high north on the Baltic North Sea and the Atlantic was, therefore, even in its earliest stage most probably contemporaneous with the victorious advance and first independent development of the Bronze Age in more southern lands, particularly on the Mediterranean.*

The maritime structures of the earth give rise to the inquiry as to the races inhabiting the sea coast and the islands, whether they developed from savagery in these centers and invented their own improvements, or received these inventions from other tribes, who had migrated from other parts, having been driven out by more civilized people. There are arguments for both theories. The similarities of the pile-dwellings and the close analogies between the maritime constructions favor the idea of a borrowed civilization, or one that was introduced by migrations. Of this Prof. Worsaae also says:

In the South Sea Islands examples have recently been met with showing that the Stone Age people, under exceptionally favorable circumstances have raised themselves to a not inconsiderable height of culture in comparison to the wretched savages in their vicinity.

Rude stone objects identically similar in form and evidently from a corresponding stage of culture can also be shown in cave, field, and coast finds from south Europe, as well as in finds from the district of Thebes in Egypt, from Japan and from the shell heaps of America. Neither in the refuse heaps of Denmark, nor in the shell heaps of Japan or America is the least trace found of a fuller development and change in ornamental objects. Besides feathers and other trophies of the chase, usually affected by savage races, their ornaments appear to have been confined chiefly to animal's teeth.

The first inhabitants of Denmark, or of southwest Scandinavia, are, therefore, to be compared most closely with the long-vanished savage races, which formed corresponding refuse heaps on the coasts of Japan and America, especially along the river margins of the latter; or with the partly still existing inferior peoples in South America, off the coast of Japan, and in the South Seas, who support themselves in the same way on shell-fish fishing and hunting. Certainly nowhere else have such rude peoples, as a rule, been in the habit of rearing great permanent monuments to preserve for thousands of years, the earthly remains of their dead. * *

It is well known that the Caribs and Andaman Islanders and others, both at high festivals and daily meals, use certain portions of their provisions, together with implements, ornaments, etc., as offerings to their gods. There is, therefore, nought to hinder the belief that a northern people on nearly the same level may have remembered their gods in a similar manner. The oldest articles of stone and bone discovered in the extreme north of Asia may have an apparent likeness to Stone Age objects from Finland, north Russia and the north of Asia, but both in material and form they differ entirely from the early Stone Age antiquities of southern Scandinavia. They constitute a distinct Arctic group in the European Stone Age.†

It is with these thoughts in mind that we take up the study of the maritime structures of the world, especially those which are of the most primitive and rudest form, and passing on from these to others that are more advanced and elaborate in character.

I. We begin with the kitchen middens or shell heaps.

* See "Pre-History of the North," page 20.

† See "Pre-History of the North," page 17.

The description of the kitchen middens of Denmark, when compared with those which have already been given of the shell heaps on the Northwest coast, will show to us how long-continued was this peculiar mode of life, even for several thousand years. It shows, also, that different classes of people—hunters and agriculturalists—were in prehistoric times, as in modern times, in the habit of going to the sea coast and for a time dwelling there, leaving the débris of the camps as signs of their presence. The fire-beds, fragments of pottery, and other relics, show that the people were accustomed to domestic life and were, perhaps, skillful in erecting habitations for themselves. The difference between the relics in the kitchen middens in Denmark and those on the Northwest coast, shows that a higher grade of progress had been reached. This is shown especially by the superior boats which were constructed out of logs, by using rude stone axes. No boats have been discovered in these kitchen middens, but so many have been found in the mounds on the coast of Denmark and Norway and Sweden, and in the bogs of Ireland, as to convey the idea that they were a sea-going people, and were skillful navigators. Deep inlets of the sea, and not a few river courses, opened a comparatively easy approach from the coasts and neighboring islands, leading through the woods to fresh water lakes in the Interior, teeming with fish, and at the same time to new and by no means unimportant resources. On the other hand, the necessity of gaining a livelihood does not appear to have driven the new settlers far from the coasts to the islands lying out in the more open sea. These facts show that the inhabitants of the world were accustomed to resort to the sea for subsistence and became navigators at a very early date; taking this for granted we may learn how the population of the globe became distributed.

As to the race which constructed the kitchen middens on the coasts of Europe, Asia, and America, it is impossible to determine, but it is supposed that the ancient Turanian people who were the first inhabitants of Mesopotamia, antedating the Semitics, were of the same race as the Finns, and it is not impossible that they made their way across Behring Strait, or the Aleutian Islands to the Northwest coast; while another branch were perhaps the ancestors of the Basques, or the Britons, who made their way across the Atlantic to the north coasts of America, and so southward.

As to the distribution of the kitchen middens, the following quotation from Nadaillac will give us some information:

The kitchen middens, or heaps of kitchen refuse—such was the name given to these shell mounds—could not have been the natural deposits left by the waves after storms, for in that case they would have been mixed with quantities of sand and pebbles. The conclusion is inevitable, that man alone could have piled up these accumulations, which were the refuse flung away day by day after his meals. The kitchen middens confirmed

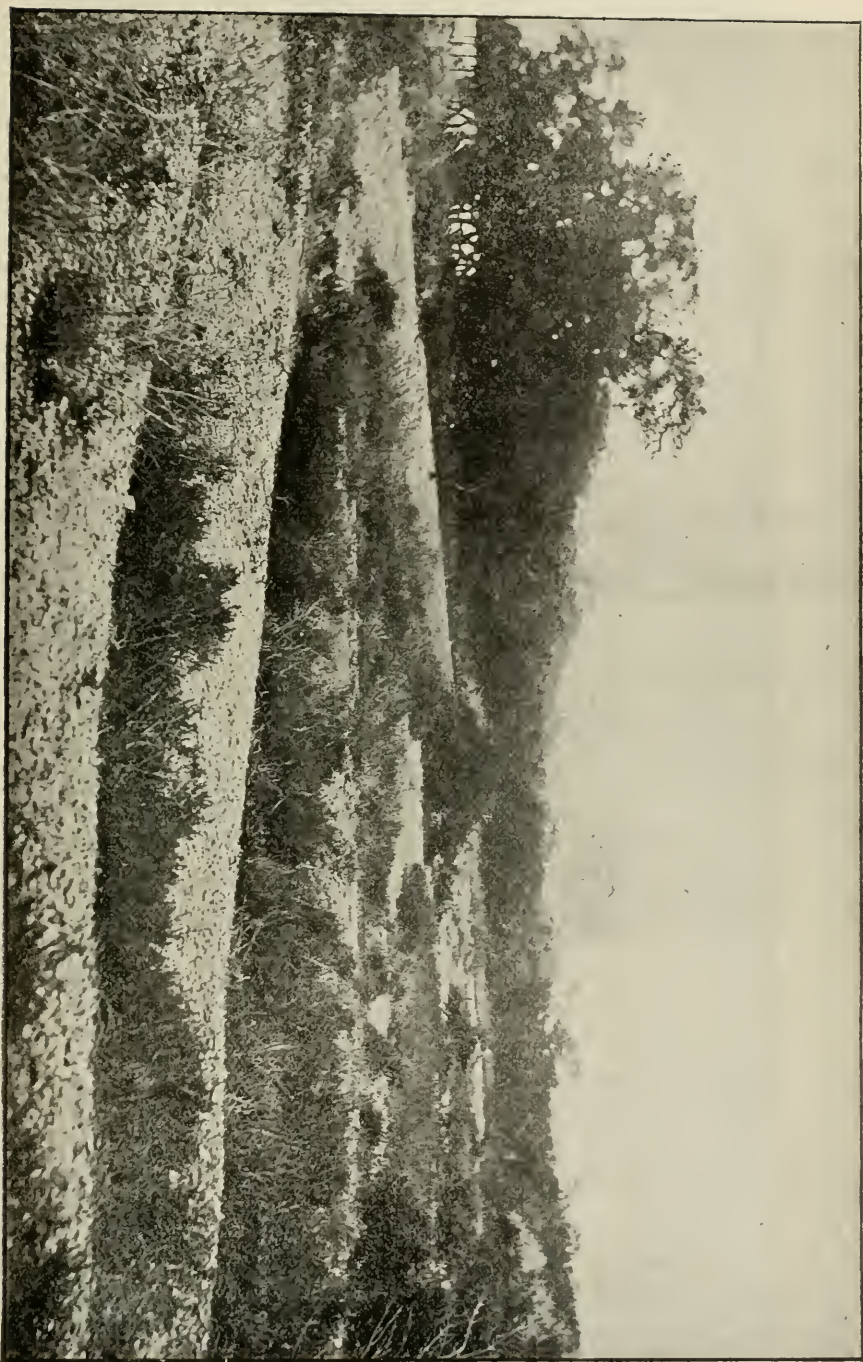
in a remarkable manner the opinion of Steenstrup, and everywhere a number of important objects were discovered. In several places the old hearths were brought to light. They consisted of flat stones, on which were piles of cinders, with fragments of wood and charcoal. It was now finally proved that these mounds occupied the site of ancient settlements, the inhabitants of which rarely left the coast, and fed chiefly on the mollusca which abounded in the waters of the North Sea. * * *

The earliest inhabitants of Russia placed their dwellings near rivers above the highest flood-levels known to or foreseen by them. Virchow has recognized on the shores of Lake Burtneck in Germany, a kitchen midden belonging to the earliest Neolithic times, perhaps even to the close of the Paleolithic period. He there picked up some stone and bone implements, and notices on the one hand the absence of the reindeer, and on the other, as in Scandinavia, that of domestic animals. But in this case, the home of the living became the tomb of the dead, as numerous skeletons lay beside the abandoned hearths. Similar discoveries have been made in Portugal: shell heaps having been found thirty-five to eighty feet above the sea-level. Here, also, excavations have brought to light several different hearths, and in many of the most ancient kitchen middens in the valley of the Tigris were found crouching skeletons, proving that here, too, the home had become the tomb. * * *

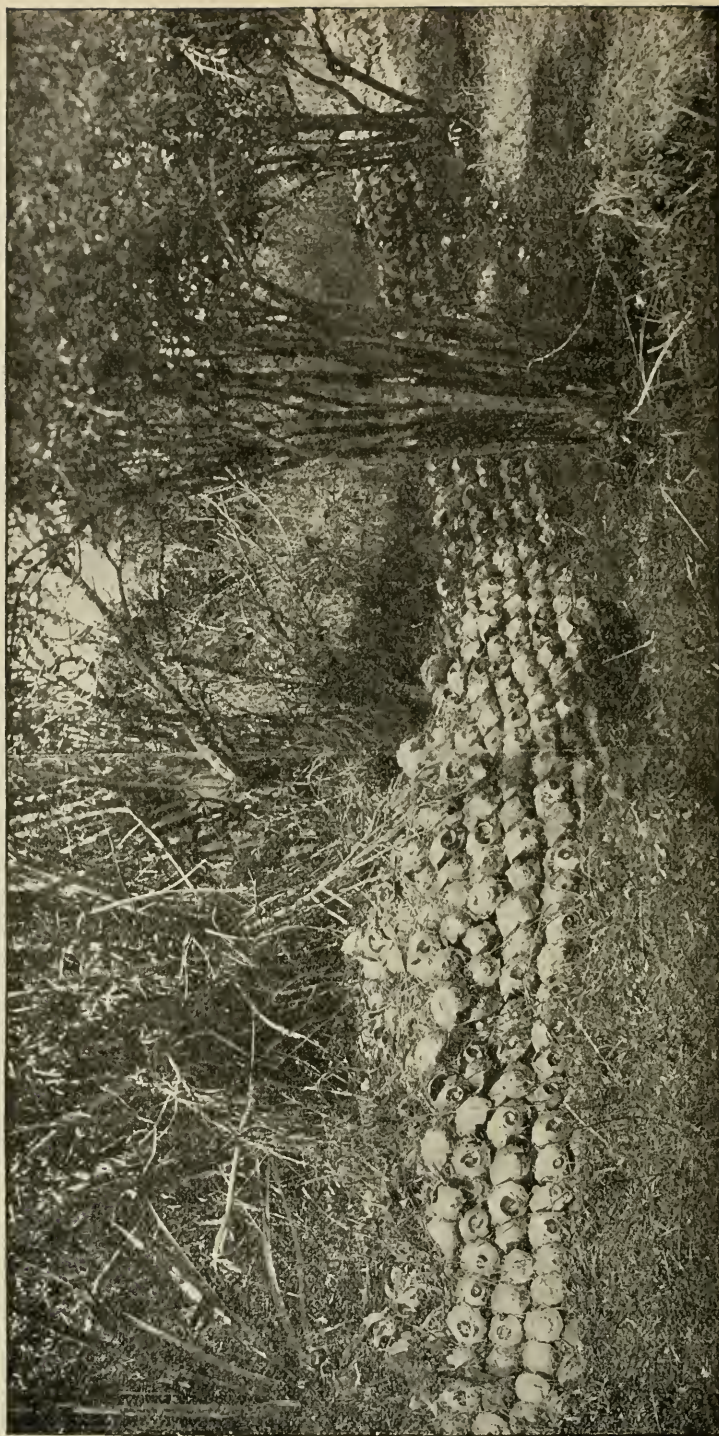
It is, however, chiefly in America that these attract attention, for there huge shell mounds stretch along the coast of New Foundland, Nova Scotia, Massachusetts, Louisiana, California, and Nicaragua. We meet with them again near the Orinoco and the Mississippi, in the Aleutian Islands, and in the Guianas in Brazil, and in Patagonia; on the coasts of the Pacific, as on those of the Atlantic. * * * The kitchen middens of Florida and Alabama are even more remarkable. There is one on Amelia Island which is a quarter of a mile long, with a medium depth of three feet and a breadth of nearly five. That of Bear's Point covers sixty acres of ground, that of Anecerty Point, one hundred, and that of Santa Rosa, five hundred. Others taper to a great height. Turtle Mound near Smyrna is formed of a mass of oyster shells, attaining a height of nearly thirty feet, and the height of several others is more than forty feet. In all of them bushels of shells have already been found, although a great part of the sites they occupy are still unexplored; huge trees, roots, and tropical creepers having in the course of many centuries, covered them with an almost impenetrable thicket. At Long Neck Branch is a shell mound that extends for half a mile, and in California there is a yet larger kitchen midden; it measures a mile in length and half a mile in width, and, as in similar accumulations, excavations have yielded thousands of stone hammers and bone implements. The shell mounds of which we have so far been speaking are all near the sea, but there is yet another, consisting entirely of marine shells, fifty miles beyond Mobile.*

We conclude, then, that the coasts of America are as good a place for the study of the beginnings of architecture as Denmark, or even the regions of Mesopotamia. The people may have belonged to a different race, but it may help us to get a very different idea of the aborigines of our country, if we associate them with the fishermen of Europe, for those in America were even more advanced in the art of boat building and house building, than were the ancient people of Europe. We have elsewhere described the houses which were erected amid the shell heaps on the Northwest coast, and shall now turn to those on the coast of Florida. The explorations of Mr. W. H. Moore and Mr. A. E. Douglas have brought out many new facts.

* See "Prehistoric Peoples."



GENERAL PLAN OF THE KEY AT MARCO.



SHELL WALLS AT MARCO,

Mr. A. E. Douglas also discovered several canals in the shell mounds—one of them five miles long; another canal connected a lagoon, through which the interior waters were expected to find an outlet to the sea. He speaks of the imposing appearance of the shell mounds and thinks that some of them were designed as lookouts or sites of houses. He refers, also, to elevated roadways leading from the mounds to a lake or water course or village, thus proving that the mounds may have been sites for houses.

Mr. William Bartram speaks of Mt. Royal as a magnificent mound, twenty feet high and 300 feet in diameter, as attended with a roadway. He says:

A noble Indian highway leads from the great mound in a straight line three-quarters of a mile, through an awful forest of live oaks. It was terminated by palms and laurel magnolias in the maze of an oblong artificial lake, which was on the edge of a greater savannah. This general highway was about fifty yards wide, sunk a little below the common level and the earth thrown up on each side, making a bank about two feet high.

There are sand mounds on the coast of Florida, which to all appearances were erected at the same time as the kitchen middens. There are on the Northwest coast kitchen middens in which are canals, harbors for canoes, and the remains of houses which resemble those which are still occupied by the Klamath Indians. These are evidently modern, but they show that the same mode of life and the same customs continued for thousands of years, even when there was no connection between the people. The same stage of society may have been reached by the people on the coast of America much later than those on the coast of Europe; the fact, however, that so much time elapsed between the kitchen middens of Norway and Denmark and those on the coasts of America, shows how prolonged this stage of semi-civilization has been upon the earth.

II. Another class of coast structures has been recently brought to light off the coast of Florida. We shall, therefore, take up the description of these as excellent specimens of the skill of the prehistoric people. They have been associated with the sand mounds and shell heaps of Florida, but they show a more advanced stage, and should probably be classed with the mounds and earthworks of the Gulf States, for it is the opinion of Dr. D. G. Brinton, Prof. F. W. Putnam and others that they were erected by the same people.

The object of these remarkable "shell keys" is unknown, but they appear to have been walls, which surrounded the sea-girt habitation of an ancient and unknown people. The "reef raised sea walls of shell" surrounded central, half natural lagoons, or lake courts, with the "many-channeled enclosures," which, when surrounded by the dwellings of the people who erected them, must have made the island resemble a modern Venice. The houses were probably constructed altogether of

wood, and perhaps covered with thatched roofs. The canals within the lagoon were dug out of low, swampy ground, and were lined with earth walls, which were covered with a tangled forest; making the ancient village resemble the villages on the coast of Benares or the Philippine Islands, more than the European Venice.

The islands lack the outside reefs which are found in the Caroline Islands, and there are no such artificial breakwaters, as are there; nor are there any such massive stone enclosures and shrines.

These were discovered and described by Mr. F. H. Cushing. The following is his account of his explorations and a description of their character and appearance:

I was not much delayed in securing two men and a little fishing sloop, such as it was, and in sailing forth one glorious evening late in May, with intent to explore as many as possible of the islands and capes of Charlotte Harbor, Pine Island Sound, Caloosa Bay, and the lower more open coast as far as Marco.

The astonishment I felt in penetrating into the interior of the very first encountered of these thicket-bound islets, may be better imagined than described, when, after wading ankle deep in the slimy and muddy shoals, and then alternately clambering and floundering for a long distance among the wide-reaching interlocked roots of the mangroves, I dimly beheld in the somber depths of this sunless jungle of the waters, a long, nearly straight, but enormous embankment of piled-up conch shells. Beyond it were to be seen (as in the illustration given) other banks, less high, not always regular, but forming a range of distinct enclosures of various sizes and outlines; nearly all of them open a little at either end, or at opposite sides, as if for outlet and inlet.

Threading this zone of boggy bins, and leading in toward a more central point, were here and there open ways like channels. They were formed by parallel ridges of shells, increasing in height toward the interior, until at last they merged into a steep, somewhat extended bench, also of shells, and flat on the top like a platform. Here, of course, at the foot of the platform, the channel ended in a slightly broadened cove, like a landing place; but a graded depression or pathway ascended from it and crossed this bench or platform, leading to and in turn climbing over, or rather through another and higher platform, a slight distance beyond. In places, off to the side on either bank, were still more of these platforms, rising terrace-like, but very irregularly, from the enclosures below to the foundations of great level-topped mounds, which, like worn-out, elongated and truncated pyramids, loftily and imposingly crowned the whole; some of them to a height of nearly thirty feet above the encircling sea. The bare patches along the ascents to the mounds were, like the ridges below, built up wholly of shells, great conch shells chiefly, blackened by exposure for ages; and ringing like their potsherds when disturbed even by the light feet of the raccoons and little brown rabbits, that now and then scuddled across them from covert to covert, and that seemed to be, with the ever-present grosbeaks above, and with many lizards and some few rattlesnakes and other reptiles below, the principal dwellers in those lonely keys—if swarming insects may be left unnamed!

Wherever revealed, the surface below, like the bare spaces themselves, proved to be also of shells, smaller or much broken on the levels and gentler slopes, and mingled with scant black mold on the wider terraces, as though these had been tilled with a view to cultivation, and supplied with soil from the rich muck beds below. Here, also, occurred occasional potsherds and many worn valves of gigantic clams and pieces of huge shells that appeared to have been used as hoes and picks or other digging tools, and this again suggested the idea that at least the wider terraces—many of which proved to be not level but filled with basin-shaped depres-

SHELL-BORDERED KEYS OFF THE COAST OF FLORIDA.



sions or bordered by retaining walls—had been used as garden plats, supplied with soil from the rich muck beds below. But the margins of these, whether raised or not, and the edges of even the lesser terraces, the sides of the graded ways leading up to or through them, and especially the slopes of the greater mounds, were all of unmixed shell, in which, as in the barren patches, enormous, nearly square-sized conch shells prevailed.

Such various features, seen one by one, impressed me more and more forcibly, as indicating general design—a structural origin of at least the enormous accumulations of shell I was so slowly and painfully traversing; if not, indeed, of the entire key or islet. Still, my mind was not, perhaps, wholly disabused of the prevalent opinion that these and like accumulations or capes of the neighboring mainland were primarily stupendous shell heaps, chiefly the undisturbed refuse remaining from ages of intermittent aboriginal occupation, until I had scaled the topmost of the platforms. Then I could see that the vast pile on which I stood, and of which the terraces I had climbed, were, in a sense, irregular stages, formed in reality a single, prodigious elbow-shaped foundation, crowned at its bend by a definite group of lofty, narrow, and elongated mounds, that stretched fan-like across its summit, like the thumb and four fingers of a mighty outspread hand. Beyond, moreover, were other great foundations, bearing aloft still other groups of mounds, their declivities thickly overgrown, but their summits betokened by the bare branches of gumbo limbos, whence had come, no doubt, the lone-sounding songs of the grosbeaks. They stood, these other foundations, like the

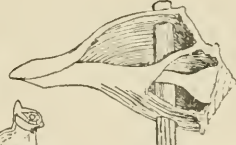
sundered ramparts of some vast and ruined fortress, along one side and

across the further end of a deep, open space or quadrangular court, more than an acre in extent, level and as closely covered with mangroves, and other tidal growths at the bottom, as were the entire swamps. It was apparent that this had actually been a central court of some kind, had probably been formed as an open lagoon by the gradual upbuilding on atoll-like reefs or shoals around deeper water, of those foundations or ramparts, as I have called them, from even below tide level to their present imposing height.

The elevation I had ascended, stood at the northern end and formed one course of this great inner court, the slope of which from the base of the mounds was unbroken by terraces and sheer; but, like the steepest ascents outside, it was composed of large weather-darkened conch shells, and was comparatively bare of vegetation. Directly down the middle of this wide incline led, between the two first mounds, a broad, sunken pathway, very deep here, near the summit, as was the opposite and similarly graded way I had in part followed up, but gradually diminishing in depth as it approached the bottom, in such manner as to render much gentler the descent to the edge of the swamp. Here numerous pierced busycon shells lay strewn about, and others could be seen protruding from the marginal muck. A glance sufficed to show that they had all been designed for tool heads, hafted similarly, but used for quite different purposes. The long columnellæ of some were battered as if they had once been employed as hammers or picks, while others were sharpened to chisel- or gauge-like points and edges. Here, too, shreds of pottery were much more abundant than even on the upper terraces. This struck me as especially significant, and I ventured forth a little way over the yielding quagmire and dug between the sprawling mangroove fingers, as deeply as I could with only a stick, into the water-soaked muck. Similarly worked shells and shreds of pottery, inter-mingled with charcoal and bones, were thus revealed. These were surprisingly fresh, not as though washed into the place from above, but as though they had fallen and lodged where I found them, and had been covered with water ever since. Here, at least, had been a water-court, around the margins of which, it would seem, places of abode whence these remains had been derived—houses rather than landings—had clustered, ere it became choked with debris and vegetal growth; or else it was a veritable haven of ancient waves and pile dwellings, safe alike from tidal wave and hurricane within these gigantic ramparts of shell, where through the channel gateways to the sea, canoes might readily come and go. It occurred to me, as I made my way through one of these now filled-up channels, that the enclosures they passed through were probably other courts—margined by artificial bayous, some of them, no doubt, like the one at Key Marco—and that perhaps the longest of them, had not only been inhabited also, but that some were representative of incipient stages in the formation of platforms or terraces, and within these, as the key was thus extended, of other such inner courts as the one I have here described.

As to the boats which were used by the inhabitants of these island keys, we have little information; but, judging from those which were used in other lands, we must conclude, that they were as skillfully constructed as were the reefs themselves.

It will be remembered that large canoes were seen by De Soto and his followers, as they reached the "great father of waters," the Mississippi; Some of them capable of holding as many as fifty warriors at a time, and were propelled with great force. Large canoes, skillfully wrought and of beautiful proportions, are even now used by the natives off the coast of Washington; showing a great proficiency in the art of boat building. They may be taken as marking the beginnings of naval architecture. No such canoes have been discovered in these island keys, but, judging from the highly wrought



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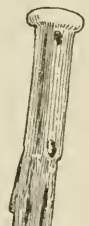
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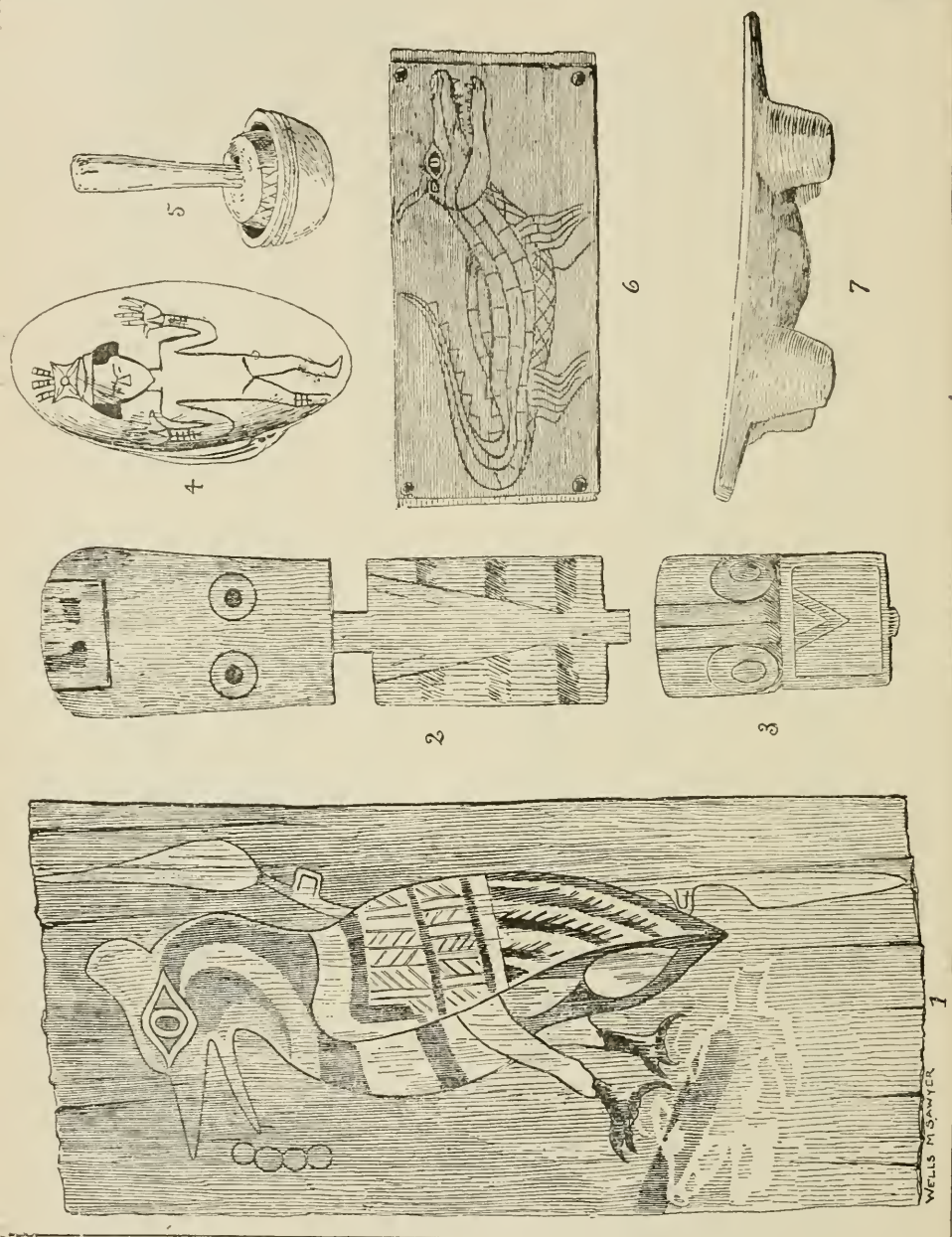


PLATE B—WOODEN TABLETS FROM THE ISLAND KEY.

wooden implements and curious masks which have been dug out from the depths of the lagoons, we may conclude that the people were not only capable of constructing such boats, but often used them in passing from one island to another, and from the islands to the shore.

Here, we would call attention to the animal figures on the tablets, which were discovered on the site of this ancient village. They remind us of the human figures carved upon the fronts of the houses in the villages of the Northwest coast. The tablets were found in the water, but they may have originally been attached to the house fronts.

Mr. Cushing has described these and has given an explanation of their significance. They show a mingling of animal and human resemblances, and give us an idea of the religious conceptions of the people who dwelt here: a religion which consisted mainly in the transforming of animals into human beings, and human beings into animals; the lines of separation between them being obliterated and all of them regarded as supernatural beings.

We do not claim for the ancient peoples, who erected these massive earthworks around their island homes and faced them with conch shells, any superiority over the white man; nor do we maintain that there was any such civilization in prehistoric times, as prevails at the present; yet the view which has been given of this ancient American Venice convinces us that the aboriginal civilization has been greatly underrated. Certainly there is no island city in modern times, which can compare with these in their peculiar adaptation to the forces of Nature and to the prevailing animal life. Here, in the midst of the waves were contrivances for the rising of the tide and catching such schools of fish as might come from out of the depths of the sea, and at the same time there was an abundance of forest trees to invite the birds of the air, especially those which gained their subsistence from the water. Beneath the trees and above the lagoons the people erected their houses, and apparently lived in peace with the creatures of the air and water; understood all their ways, and found their happiness in communing with Nature in its different moods. Whatever we may say about the architecture of the buildings, which have perished, we may conclude that there was here the perfection of art, which always consists in being artless. Various opinions

NOTE.—The following description refers to Plates A and B: Plate A—These wooden implements are worthy of notice, for they represent handles of conch-shell gouges or hoes or picks, Fig. 1; the handles of carving adzes, Figure 2; also single and double-holed atlatls or spear-throwers, one with a carved rabbit head, Figs. 3 and 4; hardwood sabre clubs, armed with sharp teeth, from twenty-four to thirty inches in length, probably like the war clubs of the Zuni Indians, corresponding to the length of the arm or of the thigh from hip to knee of those who used them, Fig. 5. Among these are two toy canoes; one of them probably an imitation of a sea-going canoe of the ancient Key-Dwellers, Fig. 6; another representing the flat-bottomed canoes used in canals, bayous, and shoal waters, Fig. 7; also a paddle of hardwood, the end of which was burned off.

Various animal figure heads were also discovered (See Plate B): one representing a wolf with large ears, Fig. 1; another, the human features, Fig. 2; another with the pelican's head and neck gracefully wrought and realistically painted, Fig. 3; still another with the human face painted on it, Fig. 4. These were masks and represented the animal and human divinities which were worshipped by the people.

have been expressed as to the people who erected these structures.

Mr. Cushing thinks that these keys, with their open channels and lesser enclosures, were the rookeries and fish-drives and fish-pools of a sea-faring people, who for some reason had forsaken the mainland and had made their homes on these isolated islands, but at the same time were agriculturalists, though they were compelled to gather the soil out from the depths of the water and make artificial gardens, in which they raised such vegetables and plants as they used. In this respect they probably resemble the famous Lake-Dwellers, who thousands of years before had placed their homes above the waters of the lakes of Switzerland, and subsisted upon fish, which there abounded; but resorted to the land for raising their cereals and the gathering of fruits. The wonder is, that they should have dared the storms and presumed to have built up their breakwaters out of such fragile material as the conch shells and earth combined, without any outside reef or sea wall to protect them from the furious waves. That they could, however, live here on these islands in security, is evident, from the fact that various white men have within a few years cleared and cultivated, as a fruit and vegetable garden, some of these very island keys. These white men (fishermen) have built platforms, constructed landings, and converted the ancient gardens into vegetable farms; but have not constructed any such massive earthworks or breakwaters as did the prehistoric people.

The prehistoric, people who settled upon these islands and built these lagoons, were not so lonely as we might at first think, as there are many other artificial keys in the same vicinity—large and small; some nearer the shore and others further away. Mr. Cushing says there are 150 in number which show signs of having been occupied in prehistoric times by the same people.

The reason for resorting to these isolated spots are unknown, but there may have been invasions from wild tribes, such as came down from the North and drove the Mound-Builders of the Ohio valley from their chosen seats and compelled them to mingle with the tribes further south. These movements of the ancient population are not recorded in history, nor are there any traditions concerning them; but judging from the relics which have been exhumed and the earthworks which have been examined, we may conclude that they were similar to those prehistoric people who built the pyramid mounds and chunky yards, which are now found in all the river valleys of the South.

We have shown elsewhere that some of these platform mounds were designed as refuges from high water, and that they were occupied by an ancient people, who were thoroughly organized into villages and were ruled by chiefs and priests. By way of comparison we shall call attention to Mr. Cushing's description of the platforms in the midst of the lagoons, to

the graded ways by which they were reached, as well as to the long, narrow earth walls which surrounded the lagoons and so made artificial enclosures; they are actually the same models in the midst of the sea, that are found upon the land; scattered through the Gulf States. Here the platforms were used as the foundations for the Great Houses of the ruling classes. The elevated mounds mark the sites of ancient temples and council houses. Walls, similar to the ridges, were constructed around the fish-ponds, and within them the houses of the common people were placed; an open court being left in the center of the village for public gatherings, and for the celebration of ceremonies.

III. These structures, situated off the coast of Florida, lead us to another and very different class of works, namely, the pile-dwellings and maritime villages which are so common in the islands of the Pacific. These present specimens of architecture which are unique and various, but they remind us of those which anciently existed in Europe, though they are still occupied.

Such pile-villages and maritime structures have engaged the attention of many writers and have often been described. Of them Mr. Nadaillac says:

There is really nothing to surprise us 'in the fact of buildings rising from the midst of waters, they were known in early historic times, Heroditus relates that the inhabitants of pile-dwellings on Lake Prasias sucessfully repelled the attacks of the Persians. Alonzo De Ojeda, the companion of Americo Vespucio, speaks of a village consisting of twenty large houses built on piles, in the midst of a lake, to which he gave the name of Venezuela, in honor of Venice his native town.

We meet with pile dwellings in our own day in the Celebes in New Guinea, in Java, in Benares, and in the Caroline Islands. Sir Richard Burton saw pile-dwellings at Dahomey; Capt. Cameron, on the lakes of Central Africa; and the Bishop of Lebuon tells us that the houses of the Dayaks are built on lofty platforms on the shores of rivers.*

Dean Worcester has described some of those in the Philippine Islands and has given several cuts of them.† Some of them were constructed by the Moros, a tribe which played an important part in the history of the Philippines, but who entered the archipelago from Borneo near the Spanish Discovery. They, no doubt, introduced a style of architecture from their native islands. The houses are placed upon wooden platforms, which are in turn supported by piles, but which are connected with the land by a narrow bridge; they are rectangular in shape and covered with a peaked roof, which has a gable end and is thatched with straw; the sides seem to be made of bamboo. There are canoes floating in the water that resemble the dug-outs of the American aborigines.

Another cut represents a Moro village, placed upon piles so near the coast that, when the tide goes out, they are con-

* See "Prehistoric Peoples," page 145.

† See "The Philippine Islands," by Dean Worcester; pages 37, 150 and 391.

nected with the land, but at high tide are reached by rude bridges or boats. They resemble the pile-villages of Switzerland in many respects.

The houses of the Tagbuanas resemble the pile-dwellings of the Moros in some respects, but are built above the land, instead of above the water. They are perched high up in the air and are supported by palm and bamboo piles. They also have a pitched roof, and bamboo sides. The Tagbuanas are wild, yet they have a simple syllabic alphabet and scratch their letters in vertical columns on bamboo poles.

The houses of the Magyars are very rude, for several families herd together on a platform of poles protected by a rude roof of rattan leaves. These people are said to be



PILE DWELLINGS IN MANILA.

head hunters. The Mindoros have more permanent houses, though they are very small and unsubstantial. Store houses for grain are placed upon rude frame-works above old stumps, and are mere thatched roofs which cover a platform.

Village life prevails in the Philippine Islands, but the villages are composed of separate houses; very many of them elevated above the ground and held in place by poles which resemble piles. A Tagalog village, which is represented in a plate, resembles very closely a Swiss lake-village. The houses are situated on platforms in a row, alongside of a canal, and are built in very much the same shape as the Swiss lake-dwellings are. Canals are very



NATIVE VILLAGES IN THE PHILIPPINE ISLANDS.



(1) The Island of Ponape, showing Volcano.

(3) The Harbor of Ualan.

MARITIME STRUCTURES IN THE CAROLINE ISLANDS.

(2) View in the Interior, Yap Island.

common in the Philippines; they radiate from the rivers in various directions. Fishermen, canoeemen, and laundrymen live in huts over the low ground near the canals.

In Tondo one finds the genuine native houses, with bamboo frames and floors, roofed and sided with palm. Destructive fires are frequent in this quarter. Earthquakes are common, as a result one rarely sees buildings more than two stories high. Living rooms are almost invariably on the second stories, the ground floor being used mainly for shops, servants' quarters, offices, or store-rooms.

IV. Our last point will be in reference to the pile-dwellings or pile-villages of Switzerland and the terramares of Italy. These very ancient structures represent a phase of architecture and a style of civilization which prevailed before the opening of history in Europe, but they resemble the structures which are now seen on the Pacific coast and in our New Possessions and are still occupied.

The discovery of these was a surprise to the European archæologists. It took place in 1853, at a time of long drought, when the extraordinary sinking of Lake Zurich revealed the piles, still standing, and between the piles the ancient hearths, pestles, hammers, pottery, hatchets, and implements of many kinds with innumerable objects of daily use.

Nadaillac says:



LAKE DWELLINGS

These relics prove that some of the ancient inhabitants of Switzerland had dwell on the lake as a refuge, to which they had probably retired to escape from the attacks of their fellow men or wild beasts. The discovery of these piles excited general interest, which was redoubled when similar discoveries revealed the fact that all the lakes of Switzerland were dotted with stations which had been built long centuries before. Twenty such stations were made out on Lake Bienné, twenty-four on Lake Geneva, thirty on Lake Constance, forty-nine on Lake Neuchâtel, and others on Lakes Sempach, Morat, Moosedorf, and Pfeffikon. In fact, more than two hundred lake-stations are now known in Switzerland.

The lake-dwellings of Switzerland may be ascribed to three different periods: the first is distinguished by small axes and coarse pottery, which had no traces of ornamentation; that of the second period had large, well-made hatchets, some of them of nephrite and jade, the pottery is finer and is ornamented including chevrons and other designs, but without handles; a third, by copper weapons and tools, a few specimens of bronze, by stone hatchets skill-

fully pierced, by pottery vases provided with handles and covered with ornaments, bead necklaces, pendants, buttons, needles, horn combs, amulets made of the teeth of animals, tools fixed into handles of stag horns, by the remains of seeds, grains and cereals, and fruits of various kinds.

The distance from the shore of the most ancient lake-dwellings vary from 131 to 298 feet. Of the most recent stations, from 656 to 984 feet. The piles of the early age from eleven to twelve inches in diameter; those of the later epochs are smaller. Care was taken to consolidate them and keep them in position with blocks of stone and tiers of piles. Keller gives to these latter the name "packwerbauten"; others call them "steinbergen." Keller says:

Household utensils, beds of charcoal, ashes, hearth stones, pottery, remains of wild animals, and the piles show that there had once been a regular settlement (or village). The piles stand in close rows and when covered with horizontal timbers and boards formed a scaffolding foundation for the erection of the dwellings. We know very little of the shape of the huts, except that they were built of poles and hurdle (or wattlework), coated on the outside with clay. The clay was spread on the floor inside the huts, in some cases mixed with gravel, forming a kind of plaster floor. In the middle of the hut was a hearth, made of slabs and rough sandstone. The roof consisted of the bark of trees, straw, and rushes, the remains of which have been preserved in the sand. The occupations of the settlers were of many kinds, but may be divided into the operations of fishing, hunting, pasturage, and agriculture. In some of the earlier settlements fishing nets and fish hooks made of bears' tusks have been found. The bones, which are found in such great numbers, show that there were domestic animals among them. Beside the lake-dwellings were to be found stones for crushing and grinding grain, or meal stones, and the grain itself has been found.

The tilling of the land must have been simple, and consisted in tearing it up by means of stag horns or crooked sticks, as is done in America. The tillage would have to be enclosed by hedges, as a protection against animals. The settlers cultivated flax of excellent quality, which was spun into threads by means of spindle whorls. Use of the loom was common. Large trunks of trees were hollowed out by fire and by stone celts, and used for canoes. Oak poles were used for spear shafts; mallets and clubs were made out of the knots of trees; boards were hewn out for the dwellings; earthen vessels were found in great abundance; urns with a large bulge and thin sides; a few flat plates and large pots, used for cooking, have been found. The vessels were ornamented with bosses, or with impressions made with the finger, or an occasional zig-zag ornament.

The oldest settlement began in that dark period when the use of metals was unknown, but no difference is to be discovered in the construction of the lake dwellings, between the earliest and latest age. The fact that the erections of the Transition and Bronze Ages were built more substantially, was owing to the use of better tools. It has been remarked that on comparing the implements of the Stone and Bronze Ages from the lake-dwellings with those which were found in mounds and in graves and those met by chance on the field, we are not able to discover the smallest difference, either in material, form, or ornamentation. The identity of the inhabitants of the mainland with those of the lake-dwellings appears still more striking, if we compare the settlements (villages). The endeavor of the settlers to live together in a sociable manner, is positive proof that they had and knew the advantages of a settled (village) mode of life, and we have to look upon them, not as a wandering, pastoral people, still less as a hunting and fishing race.

CHAPTER VIII.

THE ORIGIN OF THE ARCH AND COLUMN.

A very interesting subject is presented by the study of architecture, and especially of its beginnings. What was the origin of the architectural orders? We propose to follow it in connection with the prehistoric works of America. By analyzing these and tracing them through their different stages of growth, we may discover what are the essential elements in these orders, and so gain many hints as to their origin.

This study has, to be sure, generally been confined to historic countries, and the effort has been always to trace the various architectural forms and styles back to the early historic period, and there to discover the sources from which they sprang. The difficulty has always been, however, that about the time that students imagined that they had reached the beginnings or first stages, the tokens had disappeared, and so they have lost the clue.

The effort has recently met with more success than was anticipated, and there are those who think they have solved the riddle of the Sphinx. It is due to the archaeologists rather than the architects, for they have been very persevering in their efforts to discover these early stages, and they have not been diverted by the prospect of gain, nor hindered by the difficulties in their way, but have made great sacrifices in order to ascertain the points set before them. The archaeological discoveries made in Greece, Troy, Egypt and Assyria have carried the history of architecture very far back to its sources, and we now have at Mycenæ, the Lion's Gate, which gives to us a clue, both to the history of the arch and column together. This is a very interesting structure, and is supposed to have, so far as Greece is concerned, antedated the appearance of the architectural orders, as it was erected before the Doric migration; before the Ionic nation had arisen, and even before Corinth had come into power. The Mycenæan art, according to Tsountas, anticipated the Athenian elegance and introduced what has been called the Mycenæan Age. He says:

As an outcome of the discoveries made, there stands revealed a distinct and homogeneous civilization, a civilization so singular in many respects, that scholars have been slow to see in it a phase of unfolding Hellenic culture. At first, it was pronounced exotic and barbarous, but the wider the area laid under contribution and brought into comparison, the stronger has grown the evidence, if not the demonstration, of its substantially indigenous and Hellenic character. To-day, archaeologists generally, while allowing more or less for foreign influence, hold to this Hellenic view (if it may be so called); and it is hoped that the present work will contribute somewhat to its full demonstration.

In Greece, the different stages of progress have been traced. The earth and wood huts, which the Phrygians, dwelling in the valleys, were wont to construct, marked the first stage. These were changed into brick and into stone, and in that peculiar form of primitive dwelling, according to Adler,

was carried by Pelops into Peloponnesus as the proper type of a royal tomb. It is a familiar fact that primitive man modeled the dwelling of the dead upon the habitation of the living. No people ever copied another people's dwelling in the construction of their tombs, and the Phrygian huts were not of a kind to invite copying. Tombs worthy of comparison with the Mycenaean are yet to be found in Phrygia. Even the Carian tombs differ materially from the Mycenaean. Perot, who favored the Carian derivation of the domed tombs of Greece, now admits that those tombs are distinguished from the Asiatic specimens with which they are compared by marked and numerous peculiarities.

In huts like these, it would seem, the peoples of northern Europe once dwelt, for tombs approaching the Mycenaean types are found in Scandinavia and elsewhere. There is, then, no reason for regarding this type as peculiar to the Phrygians; any rigorous climate affords a *raison d'être*. And there is nothing in the way of our assuming that there was a time when the Mycenaeans likewise lived with their herds in similar earth and wood huts, half sunk in the ground. True, the ordinarily mild climate of Greece does not drive the inhabitants to seek shelter from the cold in cover; and, hence, we may safely conclude that the people, whose vaulted tombs perpetuate the type of those huts, came into Greece from more northern countries.

The radical difference between these domed and chambered tombs and the simple shaft graves, as we find them in the Mycenaean citadel, points clearly to a difference of race in the peoples who fashioned them. The race that copied in stone, their conical huts to serve as royal tombs could hardly have been the same who laid their princes in rude pits and heaped the earth above them. The men who sunk the shaft graves must have belonged to another race—or at least another stem—which had been early wonted to a different type of dwelling. And, in fact, we have already observed at Mycenæ a type of dwelling which differs from the earth huts, as radically as the shaft grave differs from the bee-hive or chamber tomb. These are the two-story houses, whose ground floors are without either door or window, and must have served simply as store-rooms, while the upper story alone was used as a dwelling. That the genesis of these houses must have differed widely from that of the sunken huts is self evident. Now we know that the ancient Italians built their houses on raised foundations. And it is an ascertained fact that two-story houses whose ground floors were used solely to stable the cattle were customary among the Germans, Celts, Slavs, and even among the Aryans of India; that is to say, among nearly all the peoples of the Indo-European family. And, beside these two-story houses built on *terra firma*, we find, also, in Italy, Switzerland, Austria, Germany, and elsewhere, remains of primitive lake dwellings; that is to say, of houses built upon platforms of piles driven into the bottom of a lake or marsh. If, now, we are right in tracing the two-story building back to the primitive pile dwelling, then we may conclude that a branch of the Mycenaean stock, was distinguished from another branch whose original dwelling was the earth and wood hut, had once been lake dwellers, and that their two-story stone houses were derived from the dwellings built on wooden piles above the water.*

The prehistoric structures of America, also help to carry the subject back. They, in fact, fill up that long gap which, in Europe, appears between the historic and prehistoric works, and present such a connected series, that there is a complete line of progress from the most primitive condition up to the beginning of civilization and history.

By analyzing these different structures, we find that the rude hut represents the hunter stage; the earthwork represents the agricultural state; the adobe building represents the village life; and the carved and sculptured stone structures represent

* "Mycenaean Age," pp. 243-250.

the civilized or semi-civilized condition. The architectural structures certainly present to us a much more graphic picture than the implements can do, for the same relics appear throughout all these stages, and are associated with all the grades of society, with but very little variation, while the structures are closely correlated, and in their characteristics vary according to the cultus. In Europe, the material of which the relics are composed becomes significant of the cultus, but in this country it expresses nothing. The Stone Age and Bronze Age are not recognized, for the material of the implements is the same in all parts of the country, and under all grades of cultivation. Stone is the material which is characteristic, for nearly all the implements, whether found among the Mound-builders, Cliff-dwellers or civilized races, are made of stone. Even the copper which was associated with many of the structures was not peculiar to any stage of society, for it was in use as much among the savage tribes as among the mound-builders. Bronze has been found associated with the works of Mexico and Central America, but Bronze on this continent is certainly expressive of a very different condition of society from what it is in Europe, for here it is associated with the sculptured stone edifices and is indicative of civilization, while there it is associated with the Lake dwellings, and is indicative of a stage but little removed from the savage or hunter state.

There is this advantage in taking the architectural structures to represent the stages of cultus, that we get rid of the word "age," and so have no confusion from that source. We do not know which was the first and which last, the rude hut, the earthwork, the stone structure peculiar to the cliff dwellings, or the more elaborate buildings found in Central America. We have all the stages preserved to us, even the structures which were made of the most perishable material being still found, and, in fact, in daily use. Those stages of architecture, which, owing to the perishableness of the material, have, in other countries, been lost, are here preserved in great freshness and definiteness of detail.

There is no doubt, then, that America furnishes unusual advantages for the study of architecture in its primitive stages, and that here we may ascertain, if anywhere, the origin of the architectural styles.

We now turn to a consideration of the styles, as they are discovered in America. The history of architecture involves the study of the different parts or essential elements found in every structure. These elements are common and essential, and the growth of them ultimately constitutes, in reality, the

history. Even the architectural styles and orders may be said to be dependent upon the development of these integral elements, which are so essential to a structure—much more than they are upon the ornamentation, or the mere exercise of the taste. This may be different from the commonly accepted opinion, but I think that it will be seen when we come to analyze the various styles and orders which have appeared during the historic ages. It does not appear so much in the study of the Greek orders, for these seem to have been more matters of taste and ornamentation, and a single architectural element, viz.: the column, appears in all the orders, the difference being found in the different styles of finishing the column. The history of architecture, however, must involve something more than the history of the column and its ornamentation. There were certain systems or styles of architecture which prevailed in Egypt and Assyria before the column came into use. There were also styles of architecture introduced during modern history, in which the column bears a very insignificant and subordinate part, so that, unless we rule out all those structures which were known to the ancient Egyptians and Assyrians, as not being architectural, and unless we take the position that the Gothic style was not an order, but was something different and outside of the history of architecture altogether, we must conclude that there were other elements which entered into the development of architecture beside the column. I know that there are many professed architects who deny that there are any orders except such as come from a variation of the column with its fixed proportions and shapes, but I maintain that if we are to understand architecture in its growth and history, we must look to its integral elements, rather than to its ornamentation. In a technical sense there may be only the three orders which may be supposed to have originated in the different Greek provinces, and which derive their names from them, and that the other orders are only results of the combination of these three. It matters not, however, whether, as architects maintain, there are three or six orders as such, whether we admit the Tuscan and the Roman and the Composite into the list or not, for with the subject of architecture in its technical sense we have nothing to do. It is architecture as a science that we are now studying, and not merely as an art.

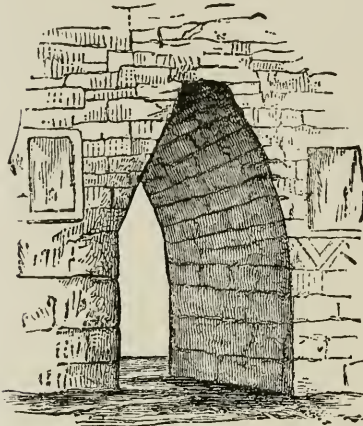
We maintain that there are integral elements in architecture, and that the pyramid, the pier and lintel, and the arch have served an important part in the history of architecture, as well as the column. In fact, these have given their char-

acteristics to the different national styles, much more than the column has. We know that the Egyptians had a style of building which was peculiar to themselves, and we know that the pyramid was the structure which was peculiar to Egypt. If we analyze and study the subject, we shall find that the Egyptian style is owing to the pyramidal shape which appears in most of the Egyptian structures. The perpendicular column and the rectilinear wall are, indeed, found in Egypt, but it seems to have been an intruded style, and that which is characteristic is owing more to the pyramidal shape, both of the walls and columns, than to any other feature.

In the Assyrian edifices, on the other hand, we find the pier and lintel to be the essential elements; the peculiar square and angular appearance of all their structures being owing to this, though we find in Assyria traces of both the column and the pyramid. Many of the palaces of Assyria were erected on lofty platforms or stages, and the early Babylonian temples were built in the shape of terraced pyramids, but the pyramid rarely entered into their structures as a type, and did not affect their style. There is no doubt that the Greek column was borrowed from the Egyptian, but the Greeks never used the pyramid, and very rarely used the square pier in their structures. The rounded column was the element which gave its distinction to the Greek style. The Romans borrowed the column from the Greeks, but they passed on from this to the use of the arch in their structures, and the peculiarity of their style was that it was a transition from the column to the arch, the columnar style retrograding, but the arch not being perfected.

The Gothic style was introduced after the Roman, and this is owing altogether to the arch, which appears in its perfect state. Now, if we are to know the history of architecture, and to understand the origin of these different styles, or orders, we shall need to study these essential elements, which we have seen to be embodied in these various structures. The arch, the column, the pier and lintel and the pyramid all need to be studied in their history, and to these particular elements we now call attention, especially because America and her prehistoric works throw much light upon them in their origin and development. The students of architecture have long sought to trace these different forms to their primitive sources, and to show through what different stages they have grown, but the effort has proven unsatisfactory. The tokens have perished. What they seek for, however, in the historic monuments of the East, they may find in the prehistoric monuments of the West.

It is probably well known that all of these forms, the arch, the column, the pier and lintel and the pyramid are found in America. They are found also in their various stages of development, so that if we would trace them to their very beginnings, we must study them on this continent. We speak of the arch here, not that we claim that America presents the arch in its perfection, or that even the principle of the arch is



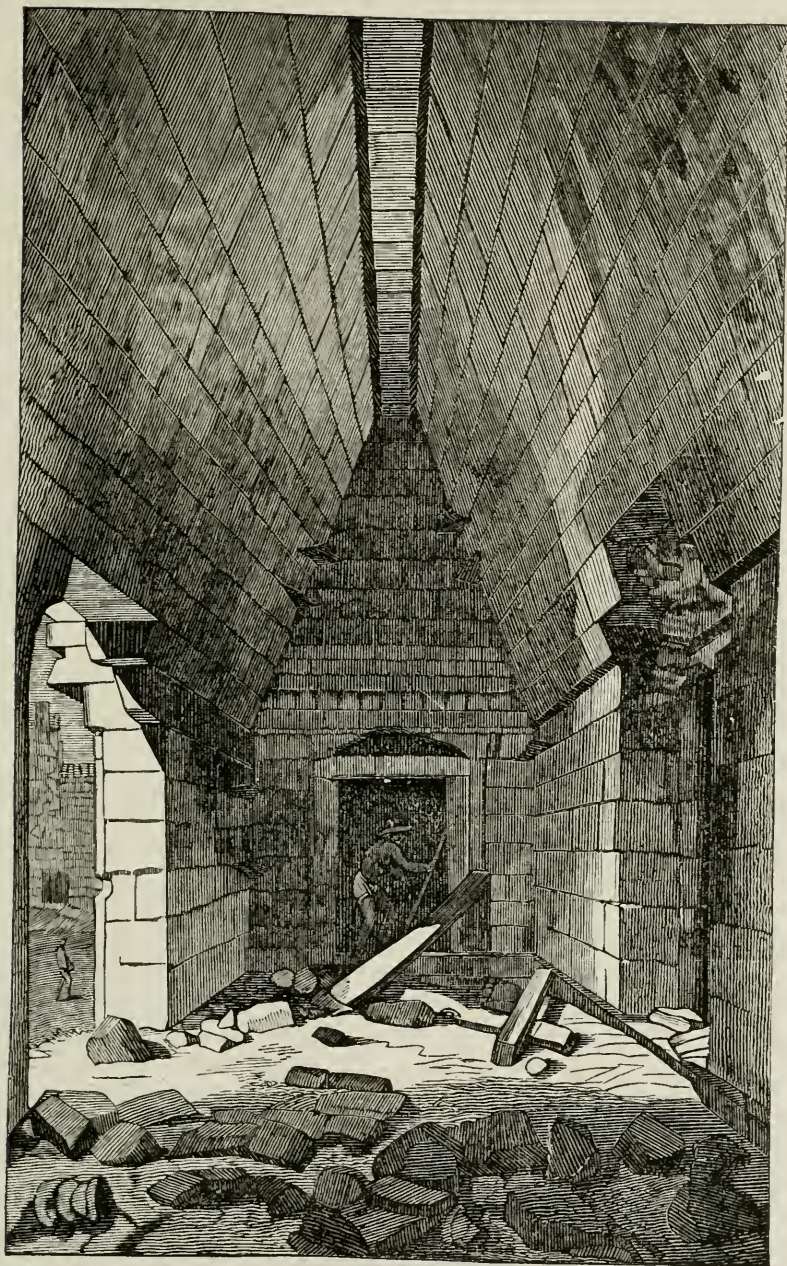
Arch found in South America

exhibited here, but because the most primitive form of the arch is prevalent, and because the history of its development can be studied on this continent better than elsewhere.

It should be said that the arch is found in America in those various stages of development which enable us to carry its history back very much farther than is possible in Eastern countries. Its latest development here presents to us a form resembling strongly the earliest form found in Eastern countries, while its most primitive form here is scarcely more advanced than we find it among the prehistoric works of Europe. One of the earliest specimens of the arch is that found in Mesopotamia, and which probably belonged to the period in which Abraham lived. We refer now to the vaulted grave-chamber which is found in the Tower of Mugheir in Mesopotamia. This tower was erected, certainly, as early as 2230 B. C. There is, however, in the palace of Uxmal, a vaulted room which presents the most striking resemblances to it, the only difference being that the vaulted roof is perfectly smooth, the corners of the stones having been beveled off, while, in the other case, the corners of the stones are left projecting into the room, and the ceiling thus presents projecting angles instead of smooth and solid surface.

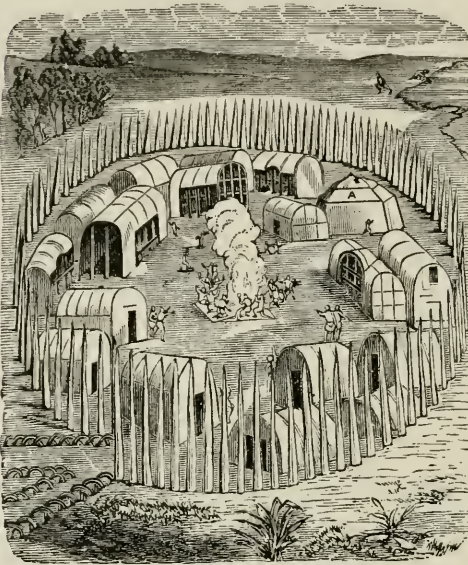
These two vaulted chambers are interesting, since they present the arch in the same stage of development, formed in either case by the layers of stone overlapping one another, and so meeting at the top. The difference of time must have been at least 3,000 years. The date of the palace at Uxmal is not known, but it is comparatively modern. It is, however, the best specimen of the form of the arch existing in America.

Perhaps a more primitive form is that found in the Algonquin huts (see p. 310), which are not made of either stone or adobé, but are wooden frame-works, covered with mats or skins.



ARCHED ROOM AT UXMAL.

It is probable, then, if we were to look for the primordial form or germ of the arch, we could go no further back than this, and our conclusion is that the form of the arch must have

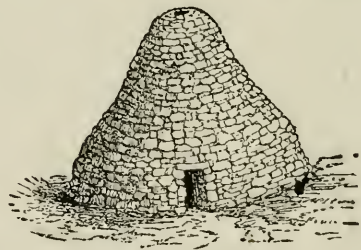


Algonquin Huts. (See page 308.)

been derived from some such aboriginal structure, this shape being very common among the rude and primitive stages of society everywhere.

This form of the arch is, in fact, scarcely different from the conical buildings, which are supposed to have been erected on the platforms of the Palafittes or Swiss Lake-dwellings, and resembles the rude huts which are found in Africa, and among savage races generally. Now it is remarkable that one of the earliest

structures in Greece, namely, the Treasury of Atreus at Mycenæ, presents nearly the same shape, that of a cone, resembling a modern lime-kiln. The same shape, also, is found in the bee-hive huts of Cornwall, England, Wales and Scotland, and the chambered burial mounds which are discovered in Scotland. Thus we have the connecting links between the most primitive form of the arch, up to its more perfectly developed shape, the progress of development reaching a higher point in the Eastern hemisphere, but beginning at an earlier stage in America.



Conical Huts in Scotland.

We turn now to the consideration of the column, and shall endeavor to trace its development from its primitive forms. It should be said that the fancies of Vitruvius concerning the column, and the reason for its adoption into architecture, are not now considered tenable, for it has been traced back through various changes, and is shown to have been derived from a

different source. If the groves were the first temples, there is no evidence that the column represented the trees. If there is a resemblance between the proportions of the different kinds of columns, and those proportions of the human body which constitute the different styles of beauty, the column has been shown by late researches to have been derived from a different source. Dr. F. Reber, who has given a very excellent treatise on the subject of architecture, has shown that it was derived from the pier, and also shown the changes through which the pier passed in reaching the rounded and fluted form of the column. His opinion is that the square pier first had its corners beveled, thus making an octagon, and then beveled again, making a sixteen-sided column; and then that the sides were gouged so as to make the fluted shape, the pedestal and capital being also by degrees changed and developed.

The earliest appearance of the column is supposed to be in the tomb of Beni-Hassan. Here it is found both eight-sided and sixteen-sided, but without any capital except a square block at the top. Perhaps, however, an earlier form may be found in the square piers, which are sometimes found connected with the primitive structures. There are grottoes in Egypt which are said to be the graves of the common people. They were dug out of the rocks in the side of the cliffs, and had narrow entrances high up in the valley, and contained roofs supported by piers. Perhaps a still more primitive form may be recognized in the pilasters or abutments which are sometimes found in the walls of ancient works, one of the earliest specimens of which may be seen in the Tower at Mugheir. The column as seen in America has the form resembling that found in the tomb of Beni-Hassan, with this exception, that it is not fluted. The fluted column is very rare in America, if it exists at all. There is no such ornamentation to the column in America, as we find in either Egypt, Assyria or Greece. That ornamentation of the capital, which constituted the Greek orders, does not appear here at all. In fact, all those stages of development which are seen in historic countries, and in which the Greek architectural orders had their beginning, were not reached here. There was no capital and no base, but it was a simple cylinder, built into the wall, and forming a relief to the bare space or deadness of it, or else occasionally placed in a doorway and used as support for the lintel, but without any architectural features either in its proportions or its ornamentations.

The main ornamentation of the column in America consisted of a series of simple bands, which were carved in relief around its center, or at intervals up and down its length.

There are many specimens of the column in this form, the most notable being those found at Casa Grande, and at Zayi, in Yucatan. Here the round column is seen, not only in the shape of a support to the lintel of a doorway, but in clusters, as parts of the entablature to the façade. It is found, also, ornamented with the raised bands, in a cluster of four, which forms a relief to the wall beside the doorway. The column is also seen in the ruins at Labna, both in the plain and ornamented shape. Here it forms the jambs or sides of the doorway, and also is seen forming an ornamental relief to a corner of the building. The column is seen in the palace at Uxmal, but instead of forming a support to a lintel or doorway, it is used only as a part of the ornamentation of the façade, and as the support of the cornice above it.

The history of the development of the column is here worthy of observation. There are, as we have said, no higher stages of development in America than those just described, but the progress of development in the East began where that in America leaves off. It appears that it was used both for ornamentation and support.

Sir Gardner Wilkinson has shown that there are five or six different styles of ornamenting the column in Egypt, and from this he makes out eight separate Egyptian orders. These are, first, the square pillar, post or stone; second, the polygonal column, plain or fluted; third, the bud capital, the oldest specimen of which is found at Beni-Hassan, being composed of four plants, bound together by a sort of necking of fine bands. In the fourth order the capital is like an inverted bell. The fifth is the palm-tree column; the sixth is called the Isis-headed order; the seventh is called the composite order, the bell, palm and Isis-head being found in combination; the eighth order is called Osiride, from containing statues of the deity Osiris.

The Greek orders, it is well known, were derived from the different ornamentation of the column, the Doric having the convex or rounded capital; the Ionic having the concave or scroll capital, and the Corinthian having the capital ornamented with acanthus leaves. These different styles of ornamentation were, however, not original with the Greeks, and have little to do, as to their origin, with the provinces whose names they bear. The Doric style was evidently borrowed from the Egyptians, and it now appears that the Ionic was borrowed from the Assyrians; while the Corinthian may be supposed to have borrowed the lotus-leaf from the Egyptians and modified it into the acanthus leaf, which is its distinctive feature. It is remarkable that the Greek orders should first appear at so high a stage of development.

There is a great gap between the Greek architecture in the orders are seen, and that which immediately preceded it. The Cyclopean architecture, which belonged to the Pelasgians, contained the column, as is seen by the specimen found in the lion-guarded gateway at Mycenæ,* but here the column is used as a religious symbol, and found in a very different shape, the taper of it being reversed, wider at the top than at the bottom. The column has not been found in Assyria, but certain drawings or sculptured figures on the terraced pyramids at Koyunjik show that both the square pier and the rounded column were common there at a very early date. The ornamentation of the capital in these bas-reliefs is quite similar to that which was afterward found in the Ionic style. There is no doubt that the Greeks borrowed from the Assyrians.

As to the ornamentation of the column in America, however, we should say that it was probably original, having been developed on American soil. There is certainly nothing like it on the Eastern continent.

Mr. Stevens and Mr. Prescott concur in the opinion that though the coincidences are sufficiently strong to authorize a belief that the civilization of Ancient Mexico was in some degree influenced by Eastern Asia, yet the discrepancies are so great as to carry back the communication to a very remote period. It is the opinion, also, of the same gentlemen, that these monuments are not of immemorial antiquity, the work of unknown men, but that they were occupied and probably erected by the Indian tribes in possession of the country at the time of the Spanish conquest; that they are the production of an indigenous school of art, adapted to the natural circumstances of the country, and to the civil and religious polity then prevailing; and that they present but very slight and accidental analogies with the works of any people or country in the Old World.

We might follow up the subject, and show how the pier and lintel and the pyramid had their different stages of development on American soil. There is no question but that these architectural forms, which have had such an influence in giving the peculiarities of style to the architecture of different nations, and which, when embodied in their structures, became essential parts of the architectural orders, may be traced back to a more primitive stage here than anywhere else. We leave the consideration of the forms as such, with the review of the arch and column, leaving the other two for a future time.

We now turn to a third view of the subject, viz.: to a consideration of the mechanical principles which underlie the

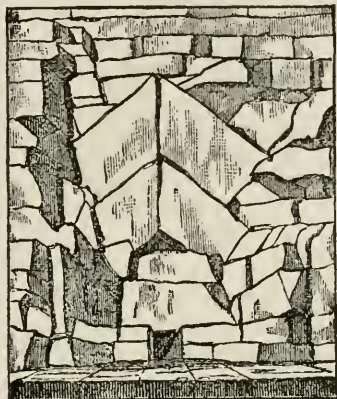
*See cut.

architectural orders. The orders, we have seen, are dependent upon the forms; the Gothic being dependent upon the arch, the Greek orders dependent upon the column, and the Egyptian styles upon the pyramid, but these orders come from the perfected forms, and from certain principles which are embodied in them. The history of the orders, then, is the history of discovery, for the forms of architecture were used long before the principles were discovered. The discovery was the last and best fruit of the form, but it was the beginning of style or order. Invention continued a long time before the orders were introduced, but when the principles contained in the forms were discovered, then the orders made rapid progress.

The four elements which we have seen to be so distinctive, and which have given their characteristics to the architectural styles, embody in themselves certain mechanical principles which make them essential. The student of natural philosophy understands that the mechanical principles are the inclined plane, screw, wheel and axle, lever and fulcrum. It has not been generally known or noticed that these common mechanical principles are at the basis of architecture, and are embodied in the various orders. The inclined plane is embodied in the pyramid, the lever and fulcrum in the lintel and pier, the screw in the column, and the wheel and axle, or pulley, in the arch. The reason why these are not noticed is that they are covered up. They exist in a passive state, and yet they are active. It is said that the arch never sleeps, and so with the pyramid, and the pier and lintel. The weight is the force that would drag down, but the mechanical principle is that which lifts up—one acting against the other, just as gravity, and the vital element or life principle are counteracting one another in the living organism. The law of strains is found here. The arch strains like a rope over a pulley; the lintel and pier like a lever on its fulcrum; the pyramid like the inclined plane; but gravity holds down all the parts, while the mechanical principle holds them up.

Architecture involves these principles as much as machinery does. In one case, however, they are found in a latent or passive state, in the other they are active. The only difference between a machine and a house, is that the force in one is active, in the other it is passive; but the machine and the house contain within themselves the same principles. So the different structures owe their architectural qualities to these latent forces. Take for instance the pyramid, which is the simplest and most primitive of all, and you will discover in it the inclined plane; the stability of the pyramid being owing to the principle. Take, on the other hand, any of those primitive

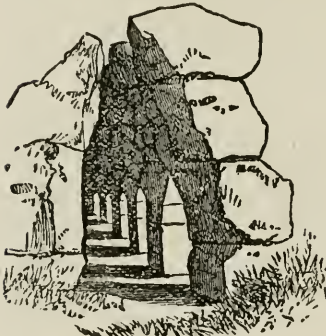
structures which contain within themselves chambers, such as the ancient tombs and palaces, and you will find in them the principle of the lever and the fulcrum. Take again the columnar buildings, whose beauty so impresses us, and you find the principle of the screw, combined with that of the lever and fulcrum. Take again the lofty, arched buildings of later date, and you find in them the principle of the pulley. Now it is remarkable that these mechanical principles, which are so well known to us, were very long in being discovered, and yet I do not know that it is remarkable, for there are persons to-day who cannot tell the difference between a true arch and a false one. A writer in Johnson's Cyclopaedia speaks of the arch as being very common and easily arrived at, and then refers to the Esquimaux ice hut as an illustration. It is plain, however, that he did not recognize this principle in the true arch. The ice hut holds together because the blocks are frozen together, and are large enough so that the force of gravity holds down the ends; but let a heavy weight be applied to the top and one will see that there is no arch there. The arch was the most difficult thing to discover. It was not discovered until very late in history; in fact it is unknown in ancient architecture, and was not introduced until after the time of the Roman Empire.



Arched Entrance to the Great Pyramid
of Ghizeh.

It is interesting to trace the efforts of the ancients to embody these different principles in their architectural structures. There is, for instance, in the pyramid of Cheops, which is the oldest of the pyramids, a chamber, which contains a series of heavy stones, in the form of lintels, one above the other, and at the top of the chamber two massive stones inclining toward one another, thus making a support as a roof for the chamber, on the inside of the pyramid; but the only mechanical principle which is reached is that embodied in the pyramid itself, for we have in the chamber the lintel without the pier, and the arch without the key-stone, and no mechanical principle embodied in them. Something a little nearer to the right conception of the arch, we may discover in some of the Cyclopean structures which are found in Greece. A specimen is found in the wall of Tiryns, near Mycenæ. It is composed of huge

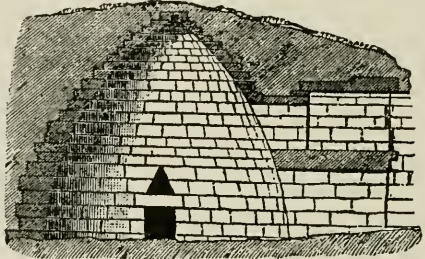
masses of rock, roughly hewn and piled up together, with the interstices at the angles filled up with small stones, but without mortar or cement of any kind. An illustration of this is given herewith. The date of this is not known.



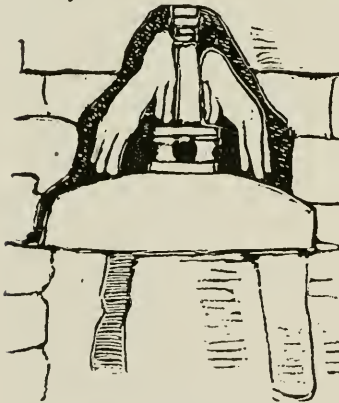
Wall of Tiryns.

these, however, is the principle of the arch embodied, the layers of stone only overlap one another, and so lean over the sides of the arch, but they are not wedged together, nor is there any key-stone. The most remarkable specimen of the arch in an unperfected form, is that found in the lion-guarded gate at Mycenæ. It is remarkable for various particulars. It

Next to this, in the stage of development and in the order of time, the Treasury of Atreus may be mentioned. We have referred to this before. This is the oldest existing structure in Greece, of regular form, and shows how early the Greeks made an attempt at building the arch. In none of



Treasury of Atreus.



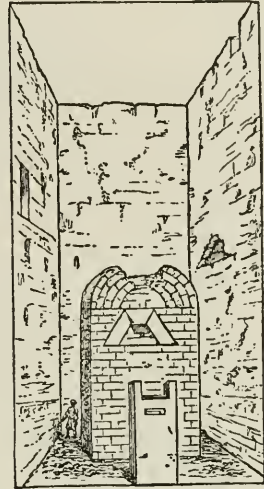
Lion-Guarded Gateway of Mycenæ.

contains the pier and lintel, which form the sides and top-piece or cap-stone of the gate-way. It contains a column resting on the center of the lintel, and also the form of the arch, the massive stones of the wall overlapping and making a vaulted space around and above the gateway, but the arch is without the key-stone, and the top of it rests upon the column, the column being supported by the lintel. In this way the weight is divided; the strain of the arch falls to the ground on either side, but that immediately above is conveyed by the column to the lintel, and is supported by the piers which form the sides of the gateway. It is a most marvellous attempt to substitute the form for the principle,

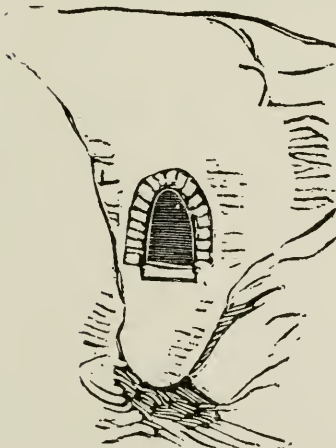
and to substitute the principle that is in the column and the pier and lintel, for that which should be embodied in the arch. This specimen may have belonged to the period of the Trojan war.

It is unknown whether the Egyptians understood the principle of the arch, or not. Fergusson and others maintain that they did, but that they were averse to using it, the heavy pyramidal being their favorite style. Rawlinson, in his *History of Egypt*, considers it doubtful. The structure known as Campbell's Tomb, for instance, is built up of good masonry, covered by three stones as struts, over which was a perfectly formed, voussoired arch. The date of this tomb is not known.

One of the earliest specimens of the true arch is probably found in the palace of Nimrud. It consists of an arched covering to a sewer, and probably belongs to the time of Nebuchadnezzar, 625 B. C. It certainly was not earlier than the time of Tiglath Pileser, 900 B. C. It is strange that the Greeks and Egyptians, with all their progress in architecture, never discovered the principle of the true arch. The Romans seem to have possessed it, and embodied it as one of the principal features of their architecture. Much of the extent and magnificence of the architectural works of the Romans is owing to their knowledge and use of it. The Gothic, however, is the style which, of all the orders known to history, most beautifully embodied the arch. It is not known whence this pointed architecture was derived, but it has been supposed that the Arabs, who learned the principle of the arch from the Assyrians, introduced it into Europe, where it was combined with the Roman.



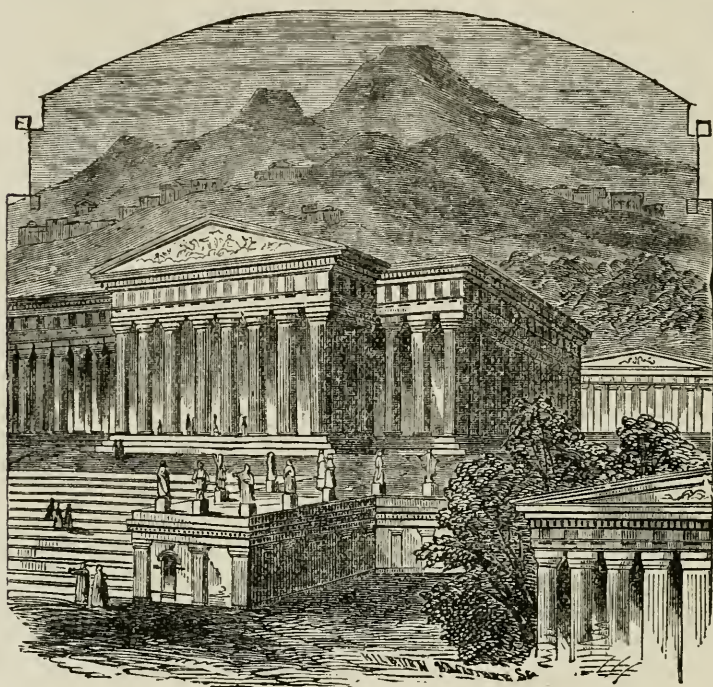
Campbell's Tomb.



Arched Covering to a Sewer.

Considering the fact of the almost simultaneous introduction of the pointed arch to the various nations of Europe,

immediately after the first crusade, and that it was commonly used in the East before that time, the most satisfactory theory seems to be that it was introduced by the crusaders in the Holy Land, and it was derived by them from the Saracens.



Temple at Ephesus.

The term Gothic has been applied to it, but it is no more Gothic than Celtic. The Goths overran Europe and found the Celtic monuments there, but they left no architecture of their own. It more properly is Christian, for it is the style in which the largest cathedrals have been erected, and is rarely used except for church architecture.

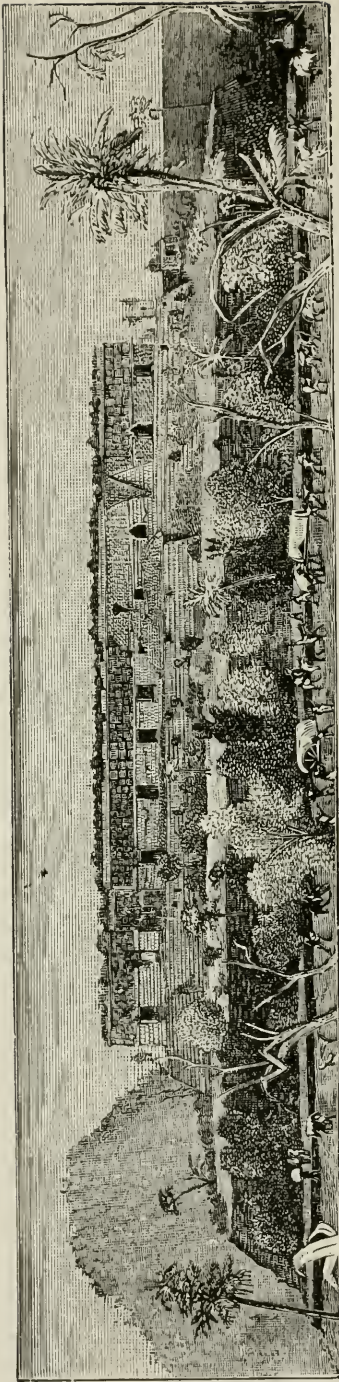
Now, as to the column, and the mechanical principle contained in it, a few words should be said in explanation. The principle embodied in the column is nearly the same as that in the pier and lintel, and so it might be difficult to see that there is any mechanical principle at the basis of the Greek orders. I think, however, that the contrast between any building which has a bare wall surrounding it, and a building erected after the Greek style, with a series of columns adorning it, and supporting the roof which projects beyond the walls, shows the point clearly. A wall may have buttresses or pilasters and so present

the form of the pier on its surface, but the beauty of the Greek style was owing to the fact that the columns were separate from the wall, and actually independent of the building. Now there is this difference in the conception of the columnar style by other nations and that which is peculiar to the Greeks, that the column was often made only a matter of ornament, as a relief to the wall, while the Greeks made it to perform a separate office, or in other words, used it as a real support. The Greek orders, then, did really embody the mechanical principle, as all of them required that the column should be separate from the wall. The progress of development of the Greek architecture also shows this, for at the first appearance the column was placed *distyle in antis*, that is, two columns between two walls, in front of the porch. At every stage of advance, however, the column became more and more independent or separate from the building itself, but became more and more essential as support for the roof. In order to show this point, we give herewith a cut of the ancient temple at Ephesus, restored. This cannot be considered as a specimen of primitive architecture, for it belongs to a most advanced stage, but it illustrates the columnar style, as contrasted with the pyramidal and the arched. It will be noticed that there is a striking resemblance between this temple and that at Olympus.* This is the more remarkable because the temple Olympus is supposed to be one of the earliest known to historic times. It shows, however, how difficult it is to trace the architecture of Greece back to its primordial forms, and how important the study of ancient American architecture becomes on this account.

There are, however, even in this grand historic temple, some analogies to the primitive structures which are found on this continent, and some points which show what features were peculiar to the early stages of architecture. The ascent to the temple by the long flight of steps is not unlike that which is seen in the ancient temples of Mexico and Central America. The prominence of the building among other buildings also shows that sacred structures were, at a very early date, made the object of artistic adornment, and so a clue to the uses of some of the unknown structures of this continent can be gathered.

The history of the column in Egyptian architecture proves the same thing. Here the column is placed on the inside instead of the outside, but the perfection of the Egyptian style is shown by the separation of the columns by the walls, and by the fact that they were made to support the roof. The

*For cut of the Temple of Olympus, see AM. ANTIQUARIAN, Vol. III., No. 4.



earliest appearance of the column in Egypt was in the tomb of Beni - Hassan. The tomb-like character of the Egyptian temples is owing as much to the multiplication of the columns in the interior, as to the erection of the propylæ in front, or to the height of the wall surrounding it.

Now, as to the development of these different features of architecture in America, we discover that while neither the principle of the arch, or the real use of the column was known, yet that there was much advance towards the true conception of them. There are forms of the arch where the overlapping stones are tilted and smaller stones are wedged in behind them, so that there is really a nearer approach to the voussoir shape than has been discovered anywhere else, except where the true arch has been employed. The arch was oftentimes substituted for the lintel, in ancient American buildings, and from this arose those peculiar shaped corridors which are found in the ruins of Palenquè.

These arches were erected above square piers, and were used both for the support of the cornices and roofs of the corridors, and as ceilings for the chambers within. Many of the terraced pyramids were built in this way, with vaulted chambers inside of them, the terraces being supported by the triangular arches, rather than being solid. There was a form of the arch in use in America which is quite peculiar. It is the tre-

foil. This may be seen by examining the cuts of the ruins of Palenquè.* This trefoil form was very ornamental, but did not contain any more strength than the triangular arch, but it illustrates the tendency to adopt the vaulted order in America.

There seems to have been a great mixture of architectural styles in America. Pyramidal temples are numerous, and associated with them, in the same locality, are buildings which embody the peculiarly square and flat style which is the result of the use of the pier and lintel, and, at the same time, other buildings, which present the lofty vaulted chambers and arched corridors, thus giving the three forms and three styles in close connection. We present a cut which illustrates this point to a certain extent, but for a further elucidation of the subject would refer to the cuts which may be found in H. H. Bancroft's work on the Native Races of the Pacific Coast, or to Baldwin's Ancient America. A form of the trefoil arch may be seen in Short's North Americans of Antiquity, as well as illustrations of the triangular arch, and of the banded column.†

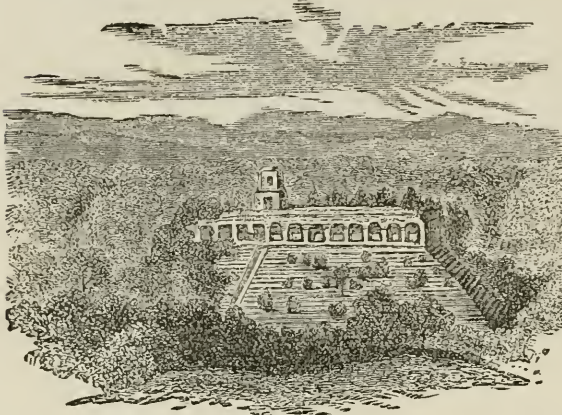
The Governor's House, at Uxmal, stands upon the upper of three platforms, of which the lowest is 575 ft. long, 15 ft. broad and 3 ft. high. The second is 545 ft. long, 250 ft. broad, and 20 ft. high. The third is 360 ft. long, 30 broad and 19 ft. high. The house itself is 322 ft. long, and 20 ft. high. It has eleven door-ways, and contains twenty-two apartments, two of which are 60 ft. long. This house may be supposed to resemble the ancient Assyrian palaces, both in its style and in its situation. The examination of its style may give an idea of the shape which those ancient structures assumed. The triangular arches seen in the façade, and the square door-ways will illustrate both of the principles to which we refer, and the varied styles and forms which prevailed here. When newly constructed, this structure, Mr. Morgan says, must have presented a striking appearance. It is doubtful whether any of the Aryan tribes, when in the middle status of barbarism, have produced houses superior to those in Yucatan.

At times, also, the three styles will be embodied in one building; a pyramid, as may be seen at Palenquè, being at the base a temple built with heavy, square piers and flat door-caps above it, and the arched or vaulted chamber found within. There are, also, other buildings, such as Casa de Monjas, at Uxmal, where the pyramid forms the foundation, a temple, ornamented with columns in its façade,

*See cut of Governor's House at Uxmal, on page 320, and of the Trocaili at Palenque, on page 322.

†See *Native Races of the Pacific States*, Vol. IV., pp. 214-217, also for arch, see pp. 191-207, 208; *Short's North Americans of Antiquity*, pp. 346-350.

and containing arched or vaulted chambers, is built above the terrace, and a terraced or pyramidal roof forms a superstructure. There are, also, buildings erected in conical form; others presenting a single chamber within a cubical built



Casa de Monjas.

structure; and others still with square piers arising one above the other, making heavy terraces, but connected by inwardly inclined walls, so as to make heavy, terraced pyramids; and others still presenting the in-

wardly inclined wall, overtopped by the heavy concave cornice, resembling the Egyptian style.

Thus we have, in America, all the forms and styles which are found in all the architectural orders, but always lacking the principle. It is strange that architecture should have advanced so far without embodying some one of the principles, and so reaching to the point of established architectural order, but it did not. Perhaps there are resemblances between the American and all the known historical styles, for the vaulted and arched corridors approach toward the Gothic style, while the columnar ornamentation resembles the Greek, and the pyramidal resembles the Egyptian, yet they show the Gothic without the true arch, the Greek without the peripteral column, and the Egyptian without the perfect pyramid.

We close this paper with a brief resumé. The architectural orders, as such, are not found in America, but the fact that architecture begins at so early a stage makes this a favorable field for the study of their origin. There is no connection between the prehistoric works of America, and the historic structures of America and the historic structures of the Eastern Hemisphere, but the architectural forms here discovered show how the orders may have arisen in historic countries. The imperfect condition in which the architecture of America was arrested, illustrates how essential to the orders the mechanical principles are, the discovery of which was not attained in America.

CHAPTER IX.

ROCK-CUT STRUCTURES AND THE HISTORY OF ARCHITECTURE.

Of all architectural works, the most interesting specimens, are those which may be classified under the general name of "Rock-cut Structures." These are not very numerous, nor are they very widely distributed, the large majority of them being situated in western and southern Asia, a few only being found in America.

The peculiarities of these structures are easily recognized and are as follows:

1. They are all cut out of the solid rock, and yet present, as a general thing, the same forms and arrangements, as those which are placed above the soil, and are constructed in the usual way.
2. Their forms, shapes, and arrangements vary according to circumstance, yet we may recognize in them, courts, and columns, altars, and stairways, sometimes arches and corridors, all of which bear the same shape as if they were erected above the earth.
3. On account of their being cut out of the rock, they are necessarily situated where the solid rock is, and are consequently found, for the most part, in places somewhat remote from the centers of population, and yet in localities where assemblies might be gathered.
4. As to their uses, they differed from one another, for some of them were evidently designed for the celebration of religious rites, others as the burial places of the noted dead, others as the abodes of religious recluses, and still others as the repository of sacred images, and the place where such images might be worshipped.
5. They differ in their date of construction, as some of them belong to the prehistoric age, others to a time preceding the Christian Era, while a third class must be ascribed to a period as late as the twelfth century, and a fourth to quite modern times.
6. The architectural features of these so-called Rock Structures are very interesting, and the more so, because they show the progress which architecture has made during successive periods of time. We do not go to them in order to discover the origin of the arch, nor to trace the origin of the column, nor even to study the history of the different styles or orders, and yet all of these elements are contained in them, and many very interesting suggestions are received from the study of them.
7. Another noticeable feature about these structures is, that they furnish in themselves a test by which we may determine the age, and perhaps even the nationalities, to which they belong. This may indeed require considerable acquaintance with the architectural styles of different periods, and nations, and yet to one who is acquainted with these it is easy to decide whether they were built by

Arabs, Syrians, Greeks, Romans, Persians or Hindoos, and at the same time fix upon the period in which they were constructed. 8. The most remarkable fact connected with these Rock-cut Structures is that they perpetuate the history of architecture in a most enduring form. Other structures may present that history with its details a little more complete, yet, if we would ascertain the earliest forms in which architecture appeared and would trace the different stages through which it passed, we will find no better source of information than these. It is indeed uncertain whether the Rock-cut preceded the rude stone monuments, and yet if we take such structures as the Sphynx in Egypt, and the statues in Phœnicia, and the rude pillars in Arabia, and the strange tombs in Malta, we



THE ANCIENT MAZZEBAH.

shall find that we have reached the borders of the Prehistoric Age. We may place them along side of the Cyclopæan walls and the stone towers, which characterized the earliest period in history. And may consider them as the immediate successors of those various structures, which belong to the prehistoric times, such as the standing stones or menhirs, dolmens, cromlechs, stone circles, cysts, and other structures of the kind. In fact there is no more important class of architectural works than these very Rock-cut structures anywhere.

In treating of these various works we shall begin with the so-called High Place, which has been recently discovered, but shall afterwards speak of the Rock-cut tombs which have been found in Egypt, Persia and other countries. We shall then describe the Rock-cut Temples of India and compare them with the Rock-cut cities of Petra, and shall close with a brief reference to the Rock-cut images found in the two Americas.

I. We shall begin with those peculiar structures which are found in connection with the "High Places," and shall reproduce a description, which has been furnished us by Professor G. L. Robinson, of one which he himself discovered. He says:

"The ancient Rock-city of Selá, or Petra, once the capital of the Sons of Esau, and situated in the heart of Mt. Seir, is in itself beyond all question the most interesting place in the Holy Land. Few travellers have ever succeeded in getting there,



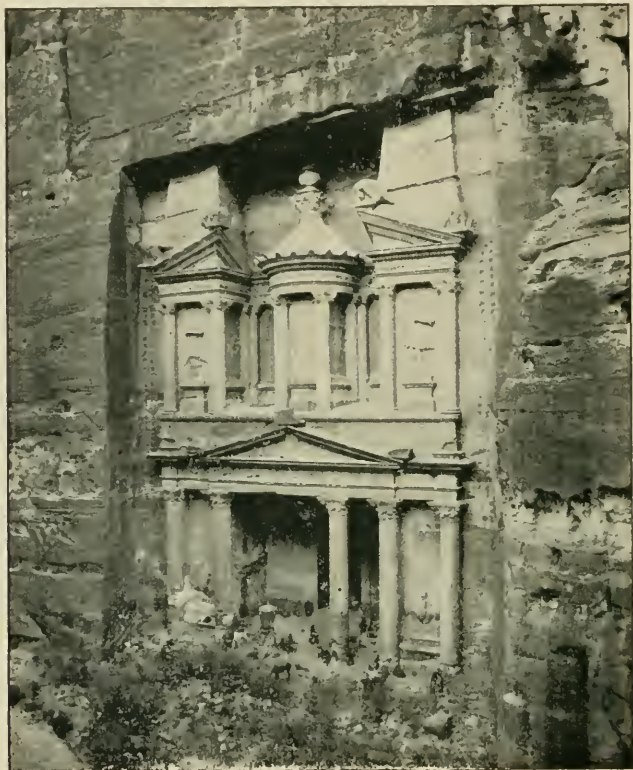
THE ANCIENT MAZZEBAH.

and still fewer have been able to leave without being fleeced by the Arabs of that vicinity. Burckhardt, Irby, and Mangles, Laborde, Robinson, Palmer, and E. L. Wilson are among those who have succeeded in seeing Petra and afterwards describing it.

The city is situated in a valley, called by the Arabs, *Wady Musa*, deep down among the mountains of Seir.

The depression is about three-quarters of a mile long from north to south, by a quarter of a mile broad, and is bounded on every side by nearly perpendicular rocks of the most beautiful colors—red, pink, lavender, chocolate, and white—and towering from two to six hundred feet above the

valley. At one time, geologically speaking, the whole basin was probably a lake. A copious stream of clear, sweet water flows down the *Wady* from east to west, having cut a most picturesque gorge through the mountains, which now provides the only approach to the city. This gorge is called the *Sik*, or *Shuk*, and is the most remarkable natural feature of the place. It is over a mile in length, and narrow, at certain points being not more than twelve feet wide, and is



ROCK-CUT TEMPLE AT PETRA.

bounded symmetrically on both sides by perpendicular, and occasionally overhanging, rocks of most exquisite coloring from two to four hundred feet in height. This ravine is one of the most romantic and enchanting places the writer ever visited. Twenty-two minutes according to the watch, were required by our animals to pass through it from one end to the other.

On coming out into the opening of the city depression, the first object to greet the eye was the famous temple of the Muses, called *el-Khusneh*, which is cut out of the dark-rose and chocolate colored rocks and stands full seventy-five feet

high from the base to the urn which adorns its apex. Proceeding further down the *Wady* a theatre, temples, and numerous tombs and rock dwellings arrest the traveller's attention, and rivet his gaze. A few ruins of ancient stone buildings lie upon the surface of the city's site in the centre of the depression. Northwest of these, some distance, situated high up among the mountains that bound the city, we visited the Deir, or Monastery, another rock-hewn temple,



THE FORTRESS, OR WATCHTOWER.

and of about the same size and style of architecture as el-Khuzneh. From the lofty roof of this immense structure we obtained a most satisfactory view of Jebel Haroun, or Mt. Hor, upon which, according to Arab tradition, Aaron died and was buried.

The entire city-site with its rocks and ravines, its temples and tombs, was strangely weird, yet fascinating; for here once lived the Troglodytes or cave-dwellers of Edom against whom the prophets so often directed their words of warning.

It was Prof. Robinson's good fortune in May, 1900, accompanied by the Rev. Archibald Forder of Jerusalem, a missionary to the Bedouin Arabs, and escorted by two Ottoman soldiers obtained from the Governor of Kerak, Moab, to visit Petra

and remain as long as he chose, without fear of being plundered by the rapacious Arabs of the vicinity. This was a rare opportunity and he eagerly improved it exploring the city and its vicinity. He says:

"On May 3rd, we climbed to the summit of one of the highest peaks which surround the Rock-city, and discovered, independently of Mr. E. L. Wilson, who with his party visited the same height in 1882, what seems to have been the chief



THE ROCK-CUT COURT.

religious sanctuary of the ancient inhabitants of Edom, viz: their "High Place of worship." We took careful notes of the whole discovery, drew a sketch-plan on the spot, measured accurately the respective dimensions of the Court, the altars, the pool, etc., located their position by compass, and secured eleven photographs of the sanctuary, Mr. Forder assisting after his arrival.*

* In reference to the High Places we would say that while very few have been found in Syria and Arabia, yet in Petra and in Phrygia, there are sanctuaries open to the sky with steps leading to them; also sacrificial altars, and a variety of symbols; yet nowhere do we find such a rare combination of altars, lavers, courts, obelisks and, circles, cut out of the rock as is presented here.

There were no images here, but as an open air sacrificial place it ranks with localities which were common in the days of Abraham, and the discovery by Professor Robinson is the more important on that account. The proximity of the High Place to the celebrated city of

1. THE SITUATION. The High Place is situated on one of the highest peaks in the immediate vicinity of the most populous part of the city, a little southwest of the Khuzneh and about the same distance southeast of the theatre. Its elevation above the bottom of Wady Musa is about 600 feet and the view from it is most imposing. The peaks of Mt. Seir to the east and southeast are naturally considerably higher, as is also Jebel Haroun three miles to the southwest.



THE MAIN APPROACH.

2. THE TWO PILLARS OR PYRAMIDAL COLUMNS. The first objects of extraordinary interest that met our eye as we neared the summit of the mountain ridge were two monoliths, or *massebahs*, about 100 feet apart and 20 feet high respectively. They were rough hewn and undetached, being cut out of the solid rock, and without any trace of inscription. Round about, the mother-rock had apparently been cut down the full length of the pillars' height, leaving a large platform bounded on the south by an escarpment about 20 feet high,

Petra makes the discovery very important, for between the two, the whole history of architecture is contained; as the High Place represents the structures which abounded in earliest times, and the rock city represents the style which prevailed in the palmy days of Rome. The development of the column with its capital, the arch and all other architectural features occurred between the two.

and on the north by a deep ravine. The two pillars are of unequal base measurements varying from 6 to 12 feet and tapering bluntly as may be seen from the photographs; the one on the east having a smaller base and consequently tapering less than that on the west. A chasm separates the Pillars from the fortress and the High Place beyond, which are situated at least 75 feet higher up.

3. THE FORTRESS. A castle covers the south brow of the



THE TWO ALTARS.

Râs, or mountain top proper. It is built of hewn stones, is now in ruins, and is of comparatively little importance, being probably of Roman or Nabathæan origin. Standing on the brink of a precipice it was easily fortified, and being more lofty than the surrounding mountain peaks, it probably served as a watch tower. It was this fortress that invited me to the actual summit. Mr. Forder tarried at the Pillars until I scaled the cliff and reported my discovery, whereupon he joined me and assisted in taking the measurements which follow.

4. THE POOL OR CISTERN. Thirty feet south of the Court is a *birket*, or pool, 10 feet long from north to south, 7 feet 8 inches broad from east to west, and about 3 feet deep. At the time of our visit (May 3,) there was still some water in it, but so far as we observed no signs of fish or life. Neither

did we discover any traces of ancient cement, but being cut in the solid rock, this would hardly be required. The surface of the surrounding rock, shelves slightly toward the pool thus enabling it to fill in time of rain.

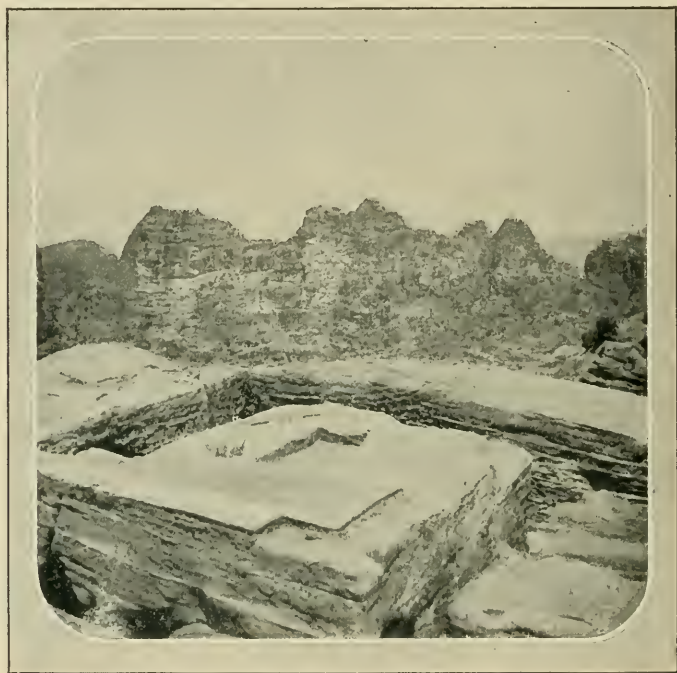
5. THE COURT CUT IN THE ROCK. On reaching the actual summit of the mountain, I was delighted to see before me, what I had searched for in vain through the peninsula of Sinai and Moab, viz; a High Place. Here, most conspicuous of all



THE POOL, OR LAVER OF PURIFICATION, WITH THE COURT IN THE BACKGROUND.

the interesting objects about me, as I walked forth upon the almost level surface of the summit, was a rock-hewn court 47 feet long by 20 feet broad, lying as my compass indicated, almost exactly north and south; cut down 18 inches deep on the east side near the south end, 16 inches at the northeast corner, 15 inches at the northwest, and 4 inches on the south half of the west side. The floor is quite smooth, dipping slightly towards the south, excepting that near the centre of it there is a raised platform 58 inches long from east to west and 31 inches broad from north to south—flat, and 4 inches higher than the surrounding surface of the Court. This raised platform, probably intended for priestly uses, as a table to

eat from (cf. 1 Sam. 9:13) or as a pedestal for an idol, or as an altar upon which the victims were slain, which is more probable, is of undetached rock, and lies considerably nearer the west side than the east, and somewhat nearer the north end than the south (see plan). The mathematical exactness with which this immense sunken area was cut into the living rock and the obvious artificial levellings on the higher surfaces about indicate that it constituted an important portion of a religious sanctuary.



THE SQUARE ALTAR.

6. THE SHALLOW CUTTING NORTH OF THE COURT. Not far to the north of the rock-cut Court, as indicated in the plan, there is another parallelogram showing distinctly on three of the four sides, the attempt to carve away the rough rock and make it level, perhaps as standing room for certain of the worshippers. Its bottom is about 18 inches higher than the level of the floor of the Court. The cuttings are shallow, not averaging over 4 inches.

7. THE APPROACH. The main approach is from the northwest. Here, as indicated in the accompanying plan, are eight regularly cut steps in the rock leading down from the northwest corner of the Court. Traces of other stairs also

are to be seen at different points on the south and west faces of the mountain, some of which I photographed, but the rock of Petra being soft, they are worn away in many cases, perhaps by atmospheric agencies, more probably by the feet of the worshippers. We approached from the southeast. Climbing up a certain ravine just south of the sacred mountain, we ascended, as my notes remind me, at first due east and later north, passing by numerous temples and tombs, here and



THE ROUND ALTAR.

there a Nabathæan inscription (of such our guide assured us squeezes had been taken by Prof. Brünnow), several terraces carpeted with grass, and about half way up an aqueduct leading down to a cistern. At different points the ascent was arduous. We descended by quite a different ravine, on the north side, leading directly down from the "Pillars" to a point not far east of the theatre.

8. THE SQUARE ALTAR. Most remarkable of all the different portions of this sanctuary, is a rectangular altar, situated on the west side of the Court, facing the east with a passageway 3 feet deep and averaging 32 inches in width running round it on the north, west, and south sides. It is about 15 feet distant from the Court, the space being levell-

ed to the bottom of the altar and accommodated to the conveniences of the priests. The exact measurements of the altar are 9 feet long from north to south, 6 feet broad from east to west, and 3 feet high from the bottom of the passage to the top, proper, of the altar. Four steps of varying heights lead up to it from the Court on the east, of which the uppermost is about 18 inches lower than the top of the altar, and approximately 3 feet long by 2 feet broad, thus furnishing a convenient standing place for the minister of the altar. The steps and altar entire are undetached, having been cut out of the mother-rock. The most interesting features of the Altar, however, are those upon its surface. As shown in the accompanying photograph, three of the four corners of the altar are cut down, with almost mathematical precision about 3 inches deep, forming angular depressions. There is none, however, on the southwest corner, which corner accordingly is the highest of the four. As a compensation the west arm of the depression on the northwest corner is considerably longer than any of the others. What these were intended for is difficult to say. Here the priests may have set their vessels or perhaps artificial contrivances, possibly of metal, like horns, which may have once ornamented the altar, and been lost (cf. Amos 3:14).

The most important depression of the upper surface is a rectangular cavity 43 inches long from north to south, 14 inches wide from east to west, and 4 inches deep. It lies, for all practical purposes, in the center of the altar's superficial area, being only a trifle nearer the west side than the east, and was probably intended as a hollow for the fire of the burnt sacrifices that were here offered; hence probably this was the altar of burnt-offering. The altar is without ornamentation and inscription.

9. THE ROUND ALTAR. Immediately south of the altar just described and separated from it only by a narrow passage 32 inches wide already referred to, is a large platform of natural rock upon which the blood of the sacrifices was probably poured out, and which we are inclined to name the "Round Altar" or "Altar of Oblation." It, too, has 4 steps leading up to it from the Court; with these two differences, however, that the stairway is on its northeast side instead of the north, and that the long broad step is the first from the bottom, not *the last towards the top* as in the case of those belonging to the "Square Altar" (see photograph). The height of this altar varies also, but at the northwest corner it measures 34 inches from the bottom of the passage. Its length and breadth are difficult to define as the altar proper gradually shades into the natural rock about, but altogether in superficial area it is considerably larger than the square altar.

Two very remarkable features characterize this portion of the "High Place," making it a sanctuary of exceptional in-

terest to the antiquarian, viz; On the top of the platform there are two concentric depressions, or Sun disks, one within the other, the smaller being the deeper of the two, while from the inmost center of the inner one there is a conduit, or drain, cut through the rock and evidently intended to carry away the blood. This conduit leads in a northeasterly direction to the edge of a semi-arched recess, or cavity, situated close by the steps on the northeast side of the Altar. The concentric rings on the surface of the Altar, though not perfectly circular, are cut with comparative precision, the outer one 46 inches in diameter and the inner one 17 inches, and being 3 and 6 inches, respectively, deeper than the surface of the Altar. These rings suggest that the sun was probably worshipped here, as was common elsewhere among Semitic peoples.

The second noteworthy feature of the altar is the tomb-like cavity in the east face which slopes toward the court. The cavity is oblong and of irregular dimensions, being 5 feet 2 inches long, 1 foot 6 inches wide, and 1 foot 4 inches deep on its east side. A narrow shelf runs along the west wall as though intended to support a cover (see photograph). The mystery of this cavity may possibly be explained in connection with the circular hole near by, which may have been used for erecting an *asherah*, or sacred pole, there being little probability that trees ever grew on the top of the mountain peak. The whole altar was evidently intended for bloody sacrifices, or more strictly, was the altar of oblation. Behind both altars a narrow ridge of low, rough rock obviated all possibility of the worshippers falling over the precipice into the chasm below. The area of the entire summit is about 300 feet from north to south and 100 feet from east to west.

From this description, it is clear, that in this newly discovered High Place at Petra we have a valuable monument to the religious worship of the ancient inhabitants of Edom. As no "High Place" has ever yet been discovered which can compare with it in size, completeness, or situation, this one accordingly stands unique. Certain altars have been found by Conder and others which are of invaluable interest to the Archæologist, but they are crude and simple compared with these on the peak above the theatre at Petra.

The date of this wonderful "High Place" is difficult to determine, but probably it came into being not later than 300 B. C., possibly earlier. In any case, it was the outward expression of a religion which had long existed there, and which had doubtless been practiced by the Edomites for centuries previous; just as the temple of Solomon was the external expression of a religion that had been believed and practiced with a greater or lesser fidelity for generations before its construction."

In reference to the High Place so well described by Professor Robinson, it should be said that the discovery is very important for the light which it throws upon the history of architecture in the East. The date of its construction has not been ascertained, yet if we compare it with other Rock-cut structures in the region and especially with those discovered in Phrygia and Asia Minor, we shall be led to the conclusion, that it is very ancient. In fact it stands between the prehistoric structures and the earliest historic, and may be regarded as one of a series which shows the progress of architecture, if it may be so called, through its various stages. It does not belong to the "rude stone monuments," for it shows the use of iron tools, and contains stone objects which have been trimmed or hewn, whereas the most of these monuments are of unhewn stone. There are, however, features, which would ally the structures with those which are peculiar to the early historic period, even with that period which was characterized by the building of the pyramids. The following are the features which should be studied in order to identify its position among the other monuments:

1. The Pillars or Obelisks. These were hewn out of the solid rock, and the rock removed from around them; but the shape in which they were left shows, that the builders were somewhat familiar with obelisks. They had certainly passed out of that stage, in which the rude, unhewn "menhirs or standing stones" were common and yet had not quite reached that stage, which was represented by the columns found in the rock-cut tombs of Beni Hassan, or that stage which represented the obelisks, whether of Egypt or Babylonia or Assyria.

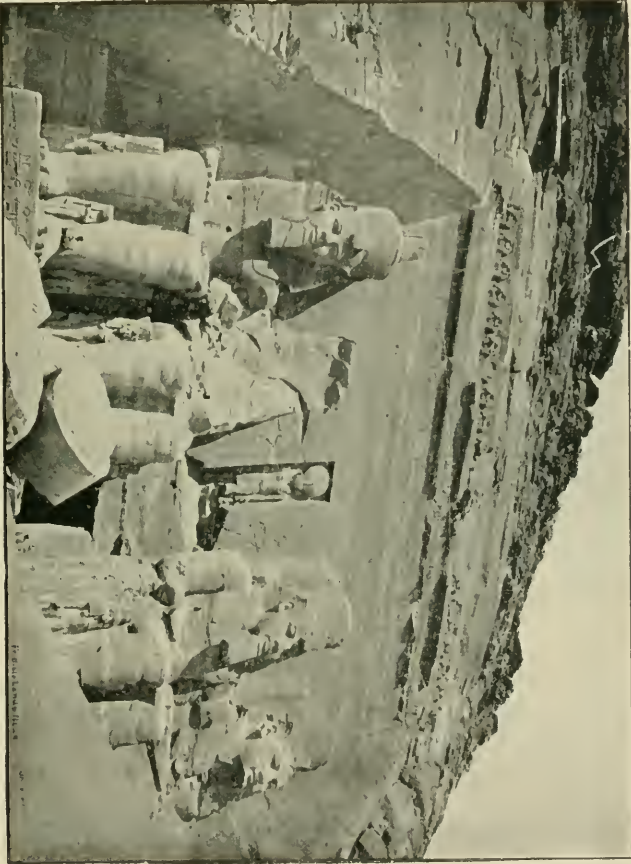
2. The court, which was hewn out of the solid rock, shows that the custom of placing a square court near the temple and of orientating it, had already been adopted. Still the fact that there was a circular enclosure sunken in the rock shows, that the custom, of making circles serve the purpose of religion, had not altogether passed away. The circle was a sure sign of sun-worship, and was used as a symbol of that cult throughout the globe. It appeared in Great Britain and in South America, and was commonly used as an open air temple. Sun-worship was common among all the pagan nations of the East, especially so among the Phœnicians. It prevailed among the Moabites and Edomites and many other Semitic tribes.

3. The Laver is an important feature. Cleanliness was required by most of the Semitic tribes. Provision for it was made in the Levitical law. The laver of brass before the tabernacle shows this, just as the images of oxen show the custom of animal sacrifice. Still there were four elements which figured in the symbolism of all primitive tribes. They were: Water, Air, Earth and Fire. We find each one of these elements symbolized in the High Place. The water by the laver,

the fire by the altar, the air or sun by the obelisk and the earth by the rock itself.

4. The altar is an important feature. The Scripture says: "Thou shalt not lift a tool upon the altar; thou shalt not lift any iron tool on them." This altar must have been hewn out by iron-tools. Sacrifices were evidently offered upon it, but it is unknown whether they were human sacrifices or not. The

TEMPLE OF RA.



fact that there were channels for blood cut in the rock is however significant.

The fact that the altar was erected upon a high place, where it could be seen by the multitude would indicate that it was an unusual sacrifice, and may have been really a sacrifice of a human victim, similar to that practiced by the king of Moab. Levitical law forbade human sacrifice, but it was a common practice among all pagan tribes. Even Abraham was

tested, and bore the test as courageously as a pagan would. One can realize how the column of black smoke, arising from above the mountain would impress the people, but the knowledge that upon the altar a human sacrifice was being offered, would make the smoke and the fire which gleamed out beneath the black clouds, doubly impressive.

5. The fact that it was upon a mountain surrounded by others, which were noted for certain historic events, and



STATUES IN THE INTERIOR OF TEMPLE.

had been made sacred by the memory of notabilities, who had died and had been buried upon their summits, must have made the scene all the more imposing. We know of no locality, which was more celebrated in antiquity than this, for here Aaron, the High Priest of the Jews, was buried, and here also other events had occurred.

6. The scene and the structures all remind us of practices which were common in prehistoric times. There is no doubt that human sacrifices were offered to the sun in many localities, and the open air temples were designed for this purpose. It certainly does not seem reasonable that such structures as Stone-henge and Avebury were, that they were erected merely for the burial of those slain in battle. But on the contrary sacrifices to the sun, at stated

Ex 20:25; Deut. 27:5; 1st K. 6:7.
2d Kings, 3:27; 2d Kings, 16:3; 2d K. 21:6.

intervals, would require just such elements as were embodied in them. In this High Place we have the obelisk, the circle, and the altar, but in addition the square court, the stairway, the laver, and the channel for blood. These were all devoted to the sacrifices which took place on this High Place, but they also exhibit the beginnings of temple architecture.

We have in a previous article described the rock-cut structures which are found in the wilderness of Sinai, in the region of Mt. Hor and in close proximity to the ancient city of Petra, a city which shows that the highest style of Roman architecture had been introduced into the midst of the desert and had covered the barren rock with the adornments of art. We now continue the subject, with a view of showing the age and period to which these rock-cut structures belong.

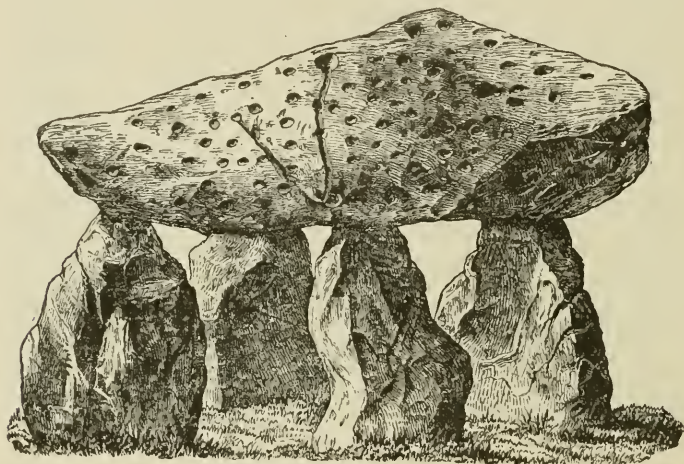
The point which we make, is that stone monuments and megalithic structures belong to the prehistoric period and constitute the beginnings of that period, but there were other structures which belong to the proto-historic period, and still others to the historic period. It may be said that the archæologists have all of them argued for the existence of a prehistoric age, and have recognized the difference between the epochs or divisions of the age, these epochs being founded upon the study of the rude stone monuments, when classified according to their characteristics and their dates. The order adopted is as follows: First, caves; second, kitchen-middens; third, mounds, tumuli and barrows; fourth, lake-dwelling, cromlechs, alignments, stone circles and crannogs, and fifth, towers. These followed one another in quick succession, and marked the stages through which society passed in prehistoric times. They, however, give very few hints as to the beginnings of historic times and furnish no evidence as to the dates in which history began.

In reference to the proto-historic period very little effort has been heretofore made to identify any class of monuments as peculiar to it, and in fact there has been a hesitation on the part of archæologists to recognize it as a distinct period. It is, however, worthy of notice that many ancient structures have been disclosed at Cyprus and Crete, and many other localities on either side of the Mediterranean Sea, which are distinct from both prehistoric and historic structures, and constitute in themselves a separate horizon, which perhaps might be ascribed to the Bronze Age.

As to the date at which the historic period began, there is much uncertainty, but the probability is that there were different dates; for recent discoveries are proving that history in Egypt and Babylonia goes many hundreds, and even thousands, of years back of the date in which the record began, either in Greece or Syria or Asia Minor, or even Crete; though in these latter regions the proto-historic period began at an early date, and tarried for many centuries.

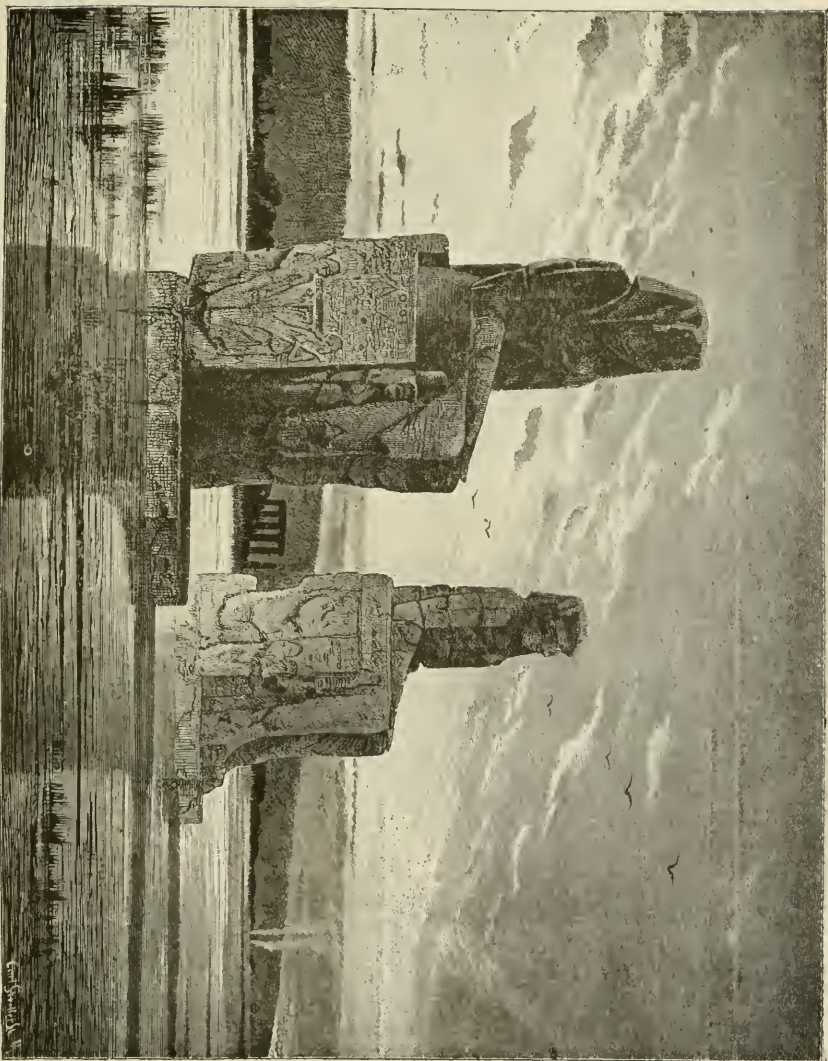
As to the monuments and tokens which characterized this proto-historic period, there is a difference of opinion, but archæologists generally are agreed that the appearance of the column and the beginning of writing constitute the line where the historic period began and the proto-historic ended. There were, however, many rude structures which preceded the appearance of the column, and yet do not belong to the prehistoric age. Among these we may mention the various altars, tombs, some of the obelisks, gateways, triangular arches, and the caves which contain the tombs, and some of the mastabas and the labyrinths. These are widely distributed, but wherever they appear they constitute the border line between the prehistoric and historic period.

Bronze also serves to mark the border line between the prehistoric and proto historic period on the one side, and the



DOLMEN WITH RUDE COLUMNS.

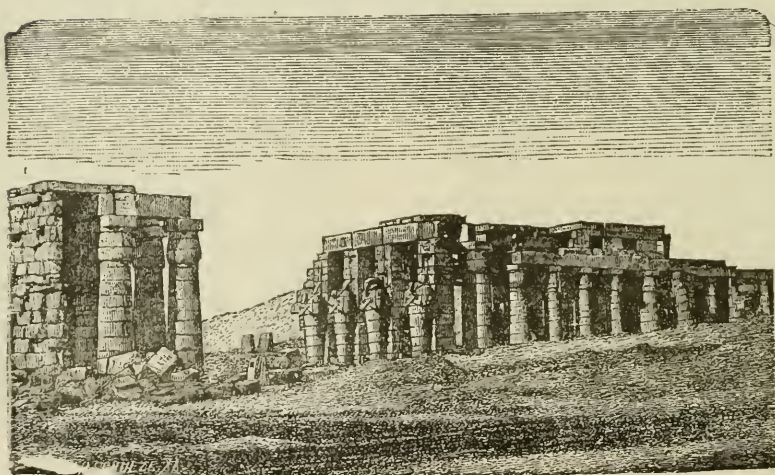
proto-historic and the historic on the other, for it was the appearance of bronze which introduced the proto-historic period, and it was with the use of iron that the historic period began. This is an important point, for the outlines of the double-bladed ax have been found on the structures which have recently been exhumed by Arthur Evans in the island of Crete, showing that the various altars and temples, palaces and halls, found there beneath the soil belonged to the Bronze Age. The same point is impressed upon us by the discoveries of Schliemann in Troy and Mycenæ. Gold was more conspicuous than bronze in his discoveries, but there are many evidences, beside the testimony of Homer, to show that it was during the Bronze Age that the proud cities began to arise. To this age we may ascribe the remarkable gateway at Mycenæ, and other structures, many of which are situated in Greece and



STATUES OF MEMNON IN EGYPT.



COLUMNS IN THE TOMB AT BENI HASSEN.



COLUMNS IN THE MEMNONIUM.

Epirus; but there are others in Asia Minor, in Phrygia, and as far east as Persia.

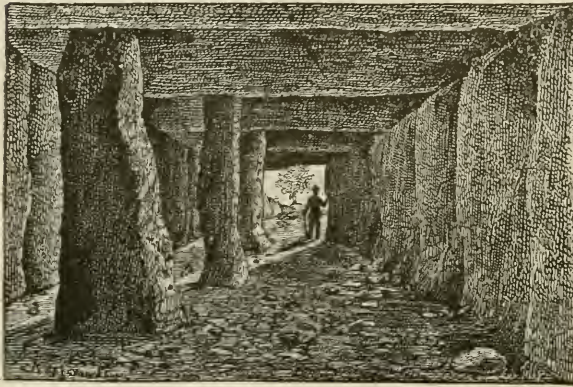
It may be said that the earliest stages of architecture are found in these rude structures, and by this means we are able to distinguish them from the rude stone monuments which are situated in the same region, but seem to have belonged to a different people and a different age.

Now, it will be profitable to take up these structures which are scattered throughout the length and breadth of this belt of latitude, and study their characteristics and see whether they do not constitute a period, as well as a stage of advancement, which can be distinguished from those which followed afterward.

1. We begin with the land of Egypt. Here the rock-cut structures are quite numerous and are somewhat familiar, because included in them, are many objects concerning which much has been written. Everyone knows about the sphinx, but this belongs to a class of rock-cut structures which have a great variety of forms, and which seemed to belong to the historic age, but after all they date their beginnings back to the proto-historic period and on this account are very interesting objects of study.

There was a great variety to the structures which were erected during this period. Some of them were merely cut out of the rock, and had no semblance to the architectural structures which appeared afterwards; others are in the shape of altars, obelisks, pillars, gateways and tombs. A very interesting class of structures, which appeared in this period, were animal and human images, all of which were cut out of the rock, the best specimen of which may be found in the Sphinx. The Sphinx is supposed to represent the king who built the second pyramid. It was carved out of a rock which broke the view of the pyramids, and is near the platform on which they stand, with its head toward the Nile. It is elevated twelve feet above the present soil. Only the head and shoulders are now visible. Some years ago, the sand was cleared away and it was found that a sloping descent, cut in the rock for 135 feet, ended in a flight of 313 steps and a level platform from which another flight of thirty steps descended to the space between the Sphinx's fore paws. The height from the platform between the protruded paws and the top of the head is 62 feet; the paws extend 50 feet, and the body is 143 feet long; being sculptured from the rock, excepting a portion of the back and the fore paws, which have been cased with hewn stone. The countenance is now so much mutilated that the outline of the features can with difficulty be traced. The head has been covered with a cap, the lower part of which remains, and it had originally a beard, the fragments of which were found below. The space between the protruded paws appears to have served as a temple, in which, at least in later times, sacrifices were performed to the deity. Immediately under the

breast stood a granite tablet, and another of limestone on either side, resting against the paws. The first contains a representation of Thothmes IV. offering incense and making libation to the Sphinx, with a long inscription in hieroglyphics, reciting the titles of the king. On the paws are many inscriptions of the Roman times, expressive of acts of adoration to the Sphinx or Egyptian deities. No opening has been found anywhere in the figure, which is probably solid rock. Though its proportions are colossal, its outline is pure and graceful; the expression mild, gracious, and tranquil; the character is African, but the mouth, the lips of which are thick, has a softness and delicacy of execution truly admirable. That it is an Egyptian head is plainly evident, notwithstanding its mutilation.



COLUMNAR DOLMEN IN EUROPE.

The type, however, is rather fuller and broader than is usual in Egyptian statues.

The statues of Memnon furnish two other specimens of rock-cut structures. These two colossal sitting figures, cut out of the solid rock,

command the approach to a temple, now in ruins, in a quarter of western Thebes. The height of each of these statues is forty-seven feet, and they rest upon pedestals about twelve feet high. One of these has excited much wonder, because of its vocal powers, for it is said to have emitted its voice at the rising sun, but Sir Gardner Wilkinson found in the lap of the statue a stone, which on being struck emitted a metallic sound, though Mr. Lane maintains that he repeatedly heard a sound, like that of a harp string, from the stone above him, which was produced from the influence of the sun's rays.

There are also rock-cut tombs and statues in Egypt. The most famous of these is the rock-hewn temple at Abou-Simbel; this temple belongs to history. On its façade are four colossal figures of Rameses II., represented as seated, sculptured out of solid rock, two on each side of the doorway. These are said to be the largest statues in Egypt. They measure from the sole of the feet to the top of the head, sixty-five feet. Over the entrance to the temple is carved in relief, the figure of the god Ra. The principal hall in the great temple is lined

with statues of the gods, also carved out of the rock. These statues belong to a comparatively late period, but are the survivals of such statues as were common in a very early period. Taken along with the Sphinx and the statues of Memnon, they show the progress of sculpture and of statuary, the seated figure being specially significant.

The best illustration of the proto-historic structure is found in the tomb of Beni Hassan. This presents the earliest and most primitive form of the column, and taken in connection with the other temples of Egypt may be said to mark the very beginnings of architecture. We see in the tomb, the earliest form of the Doric column, for it has no pediment and no capital, a mere square block takes the place of the capital. The column is a plain shaft. It has no taper, but is the same size from the bottom to the top. (See the plate)

The obelisks of Egypt are, perhaps, more strictly proto-historic structures, than are those which have been mentioned. Many of these belong to the historic period, yet they began to be built in the proto-historic period, and had many stages of development before the historic period began. The obelisks were evidently at the first sun-dials, or at least symbols of sun worship.

The resemblance between these obelisks of Egypt and those found at Petra, is especially worthy of notice. The obelisks of Egypt are covered with inscriptions, which magnify the names of the various Egyptian kings; while those which stand on the rocks above the temple at Petra are plain shafts, and have no inscriptions upon them.

2. We turn from Egypt to Crete and Paphos and the islands in the Mediterranean Sea. These localities have recently excited much attention, owing to the discoveries which have been made in them. The most remarkable of these discoveries were made by Mr. Arthur Evans in the Island of Crete, the description of which is as follows:

Mr. Arthur Evans discovered in Knossos a series of levels containing votive and sacrificial deposits connected with the cultus of the Cretan Zeus, whose special symbol was the double ax. In the central area of the palace of Knossos, he brought to light the foundations of two altars, which showed a special relation to the god of the ax.

He says: "The cult objects of Mycenæan times consisted of sacred stone pillars and trees; but certain symbolic objects, like the double ax, stood as the impersonation of the divinity." Mr. Evans also thinks that the heraldically opposed animals on either side of a central post, such as are found in Mycenæ, over the gate, may have come either from Egypt or Babylonia, but they are evidently survivals from the proto-historic period. The idea of the dolmen as a "Pillar of the House" was very prominent in this early religion. The Phrygian image of the column found cut upon the tombs, belongs to a later date, but

represents the pillar cult. He holds that the primitive pillar, with a cap stone at the top, tapered toward the bottom, and refers to a specimen of it found in a dolmen, the outside of which was made up of megaliths, which formed the roof and the sides, but were covered all over with cups or rounded cavities, the entire dolmen forming a shrine devoted to the pillar cult. Such pillars are also seen in the side cells of the megalithic buildings of the Island of Malta, an island which seems to have been filled with the traces of the two periods—the prehistoric and the proto-historic.

These prehistoric works of Malta have been ascribed to the Phœnicians, but they are the outgrowth of a cult which was wide spread and had its chief development in megalithic structures. They show that there was a gradual transition from rude stone monuments to architectural structures during the proto-historic period. The dolmen-like character of many of the Mycenæan shrines, especially those seen in the rings, some of which present the primitive forms of the trilith taken along with the gateway and its pillar, make this place an excellent locality to study the transition from the megalithic monuments to such architectural structures as the column and the arch. There were, however, places on the Island of Crete and at Knossos, which were older than these. The discovery of the shrine, the double ax, and identification of the building with the traditional labyrinth, connected with the discovery of chambers and magazines below the level of the buildings show that the earliest palace had existed in the middle of the third millennium B. C.; while in the second millennium plaster houses, with windows of four and six panes, and a street existed at Knossos. The windows were filled with oiled parchment, and not glass.

The Mycenæan culture goes back to the earlier period, for though the remains of a neolithic settlement has been found in the vicinity, buildings constructed of enormous limestone blocks in the megalithic style were characteristic of the Mycenæan homesteads. This kind of a house anticipated the Greek house of classical times. In all, thirty towns were excavated. In twenty-two of them there were megalithic walls. The houses were one-story. Huts were in the megalithic style, and yet there were stairways and streets.*

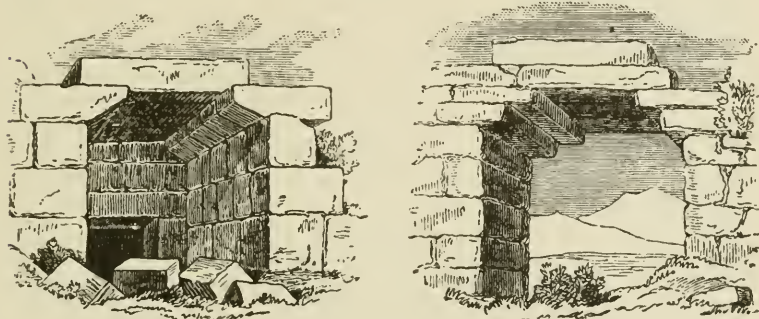
Mr. J. M. Myers holds that in pre-Mycenæan times the ideal Hellenic house consisted mainly of two single rooms—one in the rear of the other. On the other hand, Ernest Gardner holds that the primitive Greek house was something like the Greek house with the court on the inside.

3. On either side of the Mediterranean Sea in Epirus and in the region where Ilium, or Troy once stood, we find the remains of structures which evidently belonged to the proto-historic age. Schliemann has explored the region and has

* See "Journal of Hellenic Studies," Vol. XXII., 1902, page 505

brought to light specimens of proto-historic art which lay hidden beneath the soil. Among these were copper nails, bronze battle axes, lances, gimlets, knives, and brooches, along with silver ear-rings and gold ornaments. The art itself shows an early stage of development, but the architecture is more suggestive even than the art. The excavations have revealed the architecture of different ages and nations, for no less than twelve cities were built up on the same site. The fifth layer was supposed to be on the site of Troy, and the seventh on the site of Greek and Roman Ilium.

We need not dwell upon these points, for they have been discussed over and over again, but if we compare the walls and gateways, the stairways, and the various structures which are found in ruins, we shall conclude that here the proto-historic age was represented as well as the historic—the lower city being prehistoric—and that a complete record is contained in the ruins. But it may be said of the Beehive tombs and chamber tombs and treasure houses of Mycenæ, that they properly re-

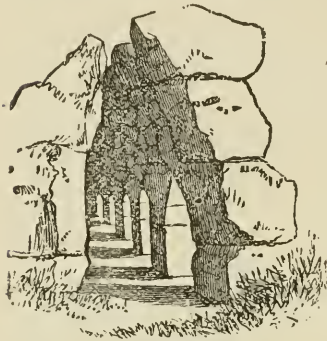


GATEWAYS AT SAMOS AND PHIGALIA IN GREECE.

present the proto-historic period. The very walls, arches and gateways present a style of masonry which is peculiar to that period. The Lion Gateway has been often referred to as belonging to the earliest period of history. This gateway is nearly quadrangular, with a height of 10 feet 4 inches, and a width of 9 feet 10 inches. The gate posts, the threshold, and the lintel are great blocks of breccia, showing clearly the marks of the saw by which they were cut out of the quarry. In the sockets we see the pivots by which the double gates turned. Above the gate, the wall is not built up solid, but the successive courses on either side overlap, until they meet in a sort of pointed arch, and thus leave a great triangular opening. This was the kind of arch which prevailed during the proto-historic period. There are many localities where it can be seen—at Samos, at Phigalia, at Delos, Mycenæ, at Tiryns, and at Ephesus. The main difference between the gate at Mycenæ and those mentioned, is, that inside this triangular arch is the

heavy pier and lintel, with statues of the lions standing upon the lintel and a pillar with a rude capital between them. This is supposed to be one of the earliest columns in existence, and the whole structure represents an early period in architecture. The recent discoveries in Knossos and in Crete show that there was a pre-Mycenæan art and architecture in the islands, but they do not refute the position which we take, but confirm it.

It is evident that in Greece the arch had its origin, for here we find gateways which show the different stages of progress



EARLIEST ARCH.

which were made before the secret of the arch was learned. In one of these gateways, we see the stones near the top projecting beyond the line of the abutment, but held to their place by the weight of the stones above. In another, we find the edges of the stones beveled but coming to a point at the top, giving to the structure the appearance of an arch. There is, however, no true arch to be found in any of these gateways, nor do we find the column with the capital anywhere in Greece at this time.

The architecture of the time was exactly in the same condition as the architecture of Peru and Central America at the time of the Discovery by Columbus.

4. There is another widespread district on the east coast of the Mediterranean, which contains a large number of proto-historic structures; some of them in Palestine; others in Syria and Phœnicia, and others in Asia Minor. The most interesting of them are east of the Jordan. Here we find rude stone monuments, so mingled with proto-historic structures that it is difficult to distinguish between them. A specimen of these has been recently exhumed from the ancient city of Gezer.

It may be said, that at this place, a succession of structures have been found, which shows that there was a gradual transition from the building of rude stone monuments to the erecting of various architectural works, though progress may have been owing to a change of the population, rather than the progress of the same people. This is made plausible from the fact, that on the east of the Jordan, and to the north of Palestine, there are many rude stone monuments which seem to have belonged to a different race, and possibly were erected by the old Hittites, though others have ascribed them to the Indo-European race.

Prof. Samuel Ives Curtis has explored the monuments of Syria and Palestine. Mr. Stewart MacAlister has explored the ruins of Gezer. He says, "Beginning at the bottom, or two lowest strata, it was found that the site was occupied by an

aboriginal, non-Semitic race, of slight build and small stature. They lived in caves and rude huts. The cave-dwellers were succeeded by a Semitic people, who lived in houses of mud and stone, surrounded with walls. In the fourth stratum, we find a 'High place,' also megalithic structures, which consist of a group of monoliths, from 5 feet 5 inches to 10 feet high; a line and circular structure 13 feet 18 inches in diameter, consisting of a rude wall, now about 16 feet high, with no opening. The fifth and sixth strata are the most interesting, for they represent the occupation of Gezer by the Israelites. Bronze is a common metal, though flint is still in use and remains of iron are found. The sixth strata is assigned to the period of the Jewish Monarchy, and the seventh to the Syro-Egyptian period in the times of Alexander."*

5. East of the Jordan were many rock-cut structures which evidently belonged to the proto historic period. These have been described by Dr. Merrill, formerly consul at Jerusalem. He quotes the language of Dr. J. G. Wetzstein: "Here is an underground city, a subterranean labyrinth. We found ourselves in a broad street, which had dwellings on both sides of it. Farther along, there were several cross streets. Soon after we came to a market-place, where for a long distance on both sides there were numerous shops in the walls. After awhile we turned into a side street, whose roof supported by four pillars, attracted attention. The roof, or ceiling, was formed of a single slab of jasper. The rooms, for the most part, had no supports, the doors were often made of a single square stone. Here, I also noticed fallen columns. The present city, which, judging from its walls, must have been one of great extent, lies for the most part over the old subterranean city."

In the same region, Dr. Merrill found some of the finest works of architecture, among which may be mentioned the Mashita Palace, built about A. D. 614; also a Roman road or pavement which shows the power and extent of the Roman Empire. These comparatively modern structures were placed amid ruins of Gadara and the tombs which belonged to a preceding age. These are dug in the limestone rock. All of them have doors of basalt. On the doors are carved panels and knockers, and bands and bolt heads, showing they belonged to the historic period. Five great fortresses were in sight.

In fact we may say that this land, east of the Jordan, has a complete series of structures, which begin with the rude stone monuments and end with the great palaces and temples which were built during the palmy days of the Roman Empire, the theatres and palaces and temples here present columns which have capitals of the Corinthian order. In the same region was situated the palace of Zenobia, the Queen, and the ruins of Tadmor in the wilderness, showing that the same fate had

* See "Biblical World," Feb. 1904, page 146; Article by Irwin M. Price.

fallen upon them, that had fallen upon the people who erected them.

Rev. J. L. Porter mentions a huge tower, rising high above the battlements and overlooking the plain of Bashan or Bozrah. He says: "From it I saw that Bozrah was in ancient times con-

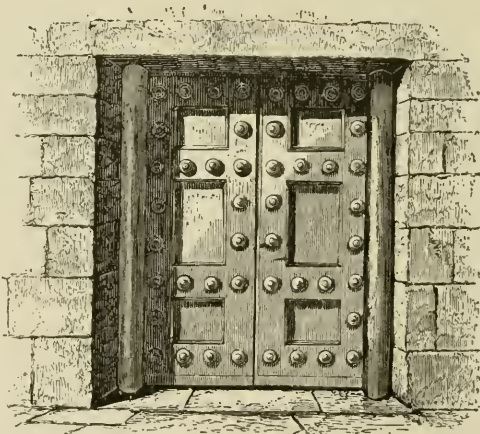


ROCK CUT HOUSE IN BASHAN.

connected by a series of great highways with leading cities. These roads are worthy of notice, for the Roman roads showed much more advancement in the art of road making than did the old Greek roads, which in fact resembled the old cyclopean archi-

itecture, and have been called the cyclopean roads, specimens of which have been described by Tsountas in his volume on the Mycenæan Age.*

The rock cut structures in the city of Bashan are in great contrast to the palaces and temples which are standing in ruins, but which were built during the palmy days of the Roman Empire, for these palaces and temples present columns which have capitals of the Corinthian order and arches, showing that architecture had reached its highest stage of development. The ruins of Tadmor in the wilderness, in which are found the palace of Zenobia, show that a worse fate had fallen upon

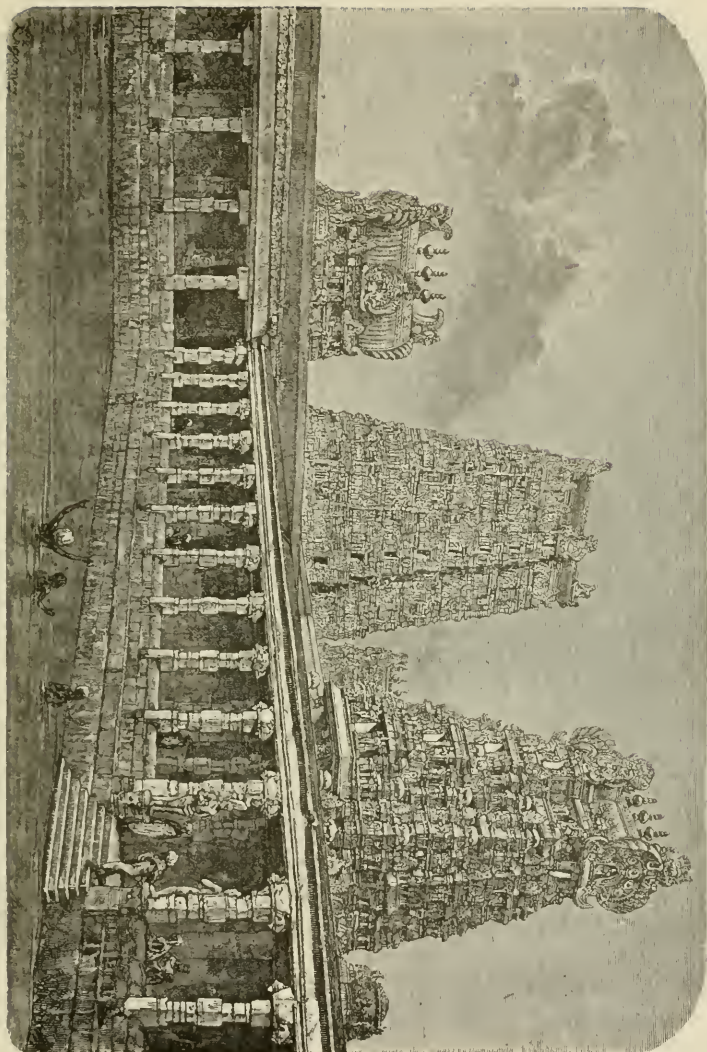


ROCK-CUT DOORWAY IN BASHAN.

them than had fallen upon the giant cities of Bashan, for these cities have been preserved exactly as they were when they were occupied. The very fact that they were cut out of the rock, have secured their preservation; while the cities which were built

* See "Mycenæan Age," page 56 fig. 8.

ROCK-CUT TEMPLE IN INDIA.

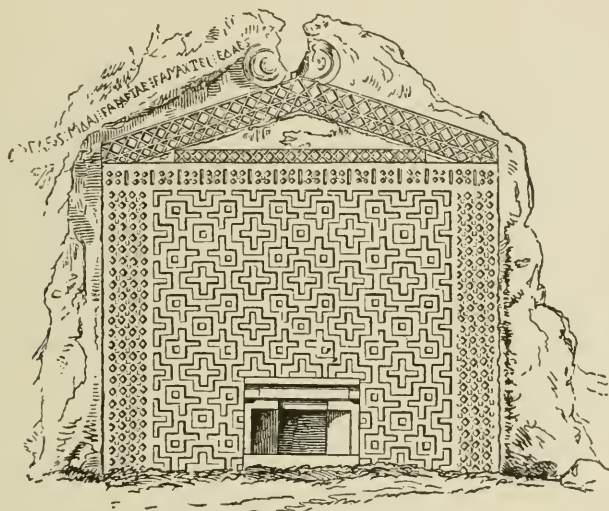




THE HINDOO TRIAD BRAHMA VISHNU AND SIVA.

up by the art of man, above the surface; and contain arches and columns and various ornaments, are in complete ruin. The theatres are the best preserved, for the seats were cut out of the rock and insured their security.

6. We turn from this region to the region, farther north in Kadesh and Hamath, Carchemish and the western bend of the Euphrates. Here was the original seat and capital of the Hittites, a people who belonged to the proto-historic period. The old southern Hittite capital was at Kadesh, though scores of Hittite remains have been found in the neighborhood of Aintab and Marash. Here, large numbers of Hittite monuments, bas reliefs and inscriptions have been found, the remains of prehistoric walls, with them some remarkable Assyrian in-



TOMB OF MIDAS.

scriptions. These show the Hittite style and form of structures, ornamentation and bas reliefs, as well as the pavements and stone slabs. The Hittites were of Mongolian stock. They are a mysterious people. They first appeared about 1600 B.C., having invaded Syria and Palestine from the far north. Their home was on the Orontes River. The Assyrian art gives us many representations of sieges and battles with the Hittites. The Hittite chariots have been depicted upon the monuments, and their faces shown.

7. It is in Phrygia and Lydia that we find the most important evidence of this little known period. Much information can be gained from the study of the rock-cut structures in reference to the period in which the people lived in tents, as well as the period which followed it, in which framed houses were erected.

Here the rock-cut tombs are imitative of the house, and all the features of early ancient house architecture have been preserved in this way, the rock being cut so as to imitate the beams, rafters, and doorways, with their jambs and panels. In other places, even pieces of furniture are imitated, and within the tombs are couches for the bodies, cut in solid rock. Even the roundels bring to mind the door knobs. The most interesting of these is the one at Midas. This has been described by Perrot and Chipiez. The peculiar pattern, seen upon its face, is said by them to have been an imitation of the drapery and the tent cloth which was made by the needle, and other portions represent the wooden framework.

The tomb of Midas is, however, no more interesting than many others found in Phrygia, Lydia, and the regions adjoining. Here there are tombs cut out of the rock, in front of which are columns built after a pattern with fine gable-ends, arches over the doorways built with sloping jambs, and a sun-symbol over the doorway, as at Ayazeen. Other tombs exhibit columns with capital, resembling the Corinthian, others with a porch in front of the chamber, and heavy Doric columns in front of the porch. The doors of the tomb are back of the porch. Most interesting are those hewn out of the solid rock, in front of which is a peculiar sculptured ornament which represents the tree or the column with a lion on either side, resembling the gate at Mycenæ. The thought has been advanced that the lions which in Babylonia guarded the portals of the palace, and were a support to the throne, are here watching over the last abode of the prince or grandee, exactly as they do over the tomb or treasure-house at Mycenæ.

There were in India many rock-cut structures, some of them of magnificent proportions; a few columns on which were carved many ornaments, but with a heavy capital on the column. A specimen of the rock-cut temples of India may be seen in the plate. This is comparatively modern, but taken in connection with the dolmens seen in the first cut, we can realize the changes which occurred in the architecture of that land, and yet the same characteristics were retained.

In Central America we find many columns arranged in clusters along the façades of these palaces. A few of them had capitals in the shape of square blocks, but the most of them were cut in the round, with bands in relief in the center, making a conventional ornament which was characteristic of the region. The conclusion which we draw, after comparing these structures of the New World with those of the Old World, is that architecture was here in about the same stage that it was in Greece, in Crete, in Cyprus, in Epirus, and at Athens during the pre-Mycenæan Age, which belonged to the proto-historic period.

CHAPTER X.

PYRAMIDS AND PALACES IN AMERICA.

We are now to take up the study of the pyramids as furnishing another illustration of the beginnings of architecture. It is to be noticed that there were different kinds of pyramids, but they all appeared at a period just following the opening of history and may be regarded as among the earliest structures erected during the historic period, the only exception being those found in America at the time of the discovery, and these may be said to really belong to the historic stage of progress, if not to the historic period. The point which we are to make in connection with the pyramids is that they mark the type of structure and the form of religion which prevailed at the earliest period, but which grew out of the structures and the religious beliefs which prevailed before they appeared. It will be profitable to us to draw the comparison between them and see what points of resemblance and contrasts there are to be found, giving especial attention to the motives and beliefs which resulted in the erection of these massive structures.

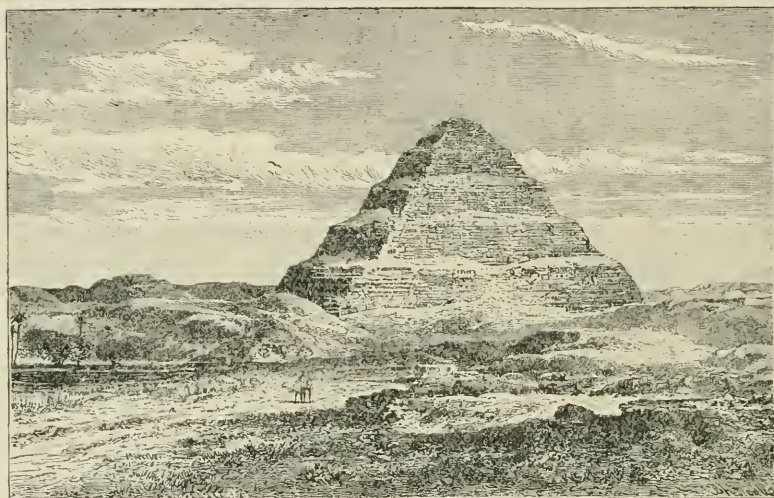
We have shown already that there were rock cut structures and obelisks and altars, as well as tombs, in the various countries of the East, but whether the pyramids preceded or followed these, remains at present uncertain. Still if we take the line of architectural development for our guide, we would naturally conclude that the pyramids were all subsequent to the erection of the rude stone monuments, and these were subsequent to the mounds and caves, the line of succession making it appropriate to consider the pyramids after the ruined cities and the rock cut structures.

In treating of the subject we shall begin with the Pyramids of Egypt and show their purpose, manner of construction, date of erection, and the motive that ruled, and afterward take the pyramids of Babylonia, and follow these with a description of the pyramids of America.

I. Our first inquiry will be in reference to the pyramids of Egypt and the contrast between them and those of other lands. It is well known that the earliest pyramids in Egypt

were erected by a dynasty of kings who had come into power and who brought the people into subjection, so that they were ready to obey their commands, and by this means, the resources of the kingdom were brought under their control. It is supposed also, that the religious sentiment had great sway. These pyramids stand upon the edge of a desert upon the western bank of the Nile, near the point where the river divides into its many mouths or outlets, showing that the dynasty which was in power held control of the lower Nile and were in a comparatively high stage of development.

The three pyramids of Gizeh, called Cheops, Chephrens and Mycerinus, are supposed to be the earliest, though there are many others of these massive burial vaults near the metropolis of the ancient city of Memphis and scattered along the



PYRAMID AT SAKKARAH.

plateau of the Libyan desert for a distance of many miles. They were erected as monuments of the kings and designed to preserve the bodies of the kings in power, and were really burial vaults, though they were monuments to the kings and designed to preserve the body of the kings. It was the belief in immortality that was the ruling motive, but an immortality which consisted in the preservation of the material form rather than the survival of the spirit as separated from the body.

The first requirement for the actual construction of the pyramid appears to have been the leveling of the rock surface. This was followed by the excavation of a subterranean

The form of this pyramid shows that it was modeled after a series of mastebahs, one above another.

an chamber and the erection of a small truncated pyramid or mastabah in the center of the rock. If the life of the king were prolonged, he added new outside layers of stone, following the outline of the first structure, thus enlarging the mastabah or tomb, the pyramid arising in terraces, and really becoming a gigantic mastabah. The opening to the mastabah or tomb was below the pyramid and was reached by a long channel or passageway which had been cut out of the rock.

The size of the pyramids shows the great power which the king had, and at the same time illustrates the mechanical contrivances which were in use at the period. Still the expense of constructing the first pyramid was so great that it nearly exhausted the resources of the kingdom, and the successors to the first monarch were obliged to build on a smaller scale, and finally to cease pyramid building altogether.

The situation of the pyramids marked the dividing line between life and death. On one side we see the River Nile, with the luxuriant fields bordering the river, but on the other side all is desolation and dreary waste. The drifting sand shines under the glare of the noonday sun, dotted here and there with the crumbling remains of ancient tombs. The pyramids were illustrative of the belief of the people. According to this belief every individual consisted of three distinct parts; the body belonged to this world, the soul belonged to another world, and the double which belonged to the two worlds. A double was generally in the form of a statue and was preserved in the tomb. The pyramid itself, however, was the means of preserving the body, and the utmost precaution was taken lest the tomb should be opened and the pyramid be despoiled of the body. There was orientation practiced in connection with this pyramid. It was, however, an orientation which appeared only at the earliest period, an east and west orientation, proving that the worship was in all probability equinoctial, proving also that the erection of the pyramid had something to do with the rising of the Nile and the sowing time, and the harvest time, the inundation of the Nile being the source of life and prosperity to the people. The erecting of the sphinx near the pyramids was also suggestive of the religious belief of the people. It is not known at present what king erected the sphinx, but as it is situated east of the middle pyramid and in the immediate foreground, and was sculptured from the solid rock so as to look toward the rising sun, it is supposed that it was wrought out at the time when the equinoctial worship was prevalent and before the solstitial worship came into vogue.

To the ancient Egyptian the River Nile was a mystery. They believed that a god dwelt within its waters. It was perfectly natural that the temples should be made sacred to the gods which ruled over the waters, and that the lotus plants which grew in the waters of the Nile should be imitated in the pillars that adorned the temples. The trinity of the Egyp-

tian gods consisted of Osiris, Isis, and Horus. The images of these gods were placed in the temples, but there were no images in the pyramids or even outside of them, except the image of the sphinx, which was represented as having the form of an animal with a human head, and was regarded as a symbol of Horus, the early morning sun.

The association of the pyramid and temple is to be considered in this connection. There are temples in Egypt which were erected long after the days of the pyramids, and by dynasties which were entirely distinct from the pyramid builders, but the earliest temples are supposed to have been contemporaneous with the pyramids. The temple of the Sphinx shown



in the cut is proof of this. It was discovered in 1853. It lies below the level of the sand and was constructed by the pyramid builder. In a deep well in the corner of one of the rooms were found nine statues of Chephren or Cheops. The columns of this temple differ from those found in any of the later temples. They are mere massive blocks of granite without ornamentation, and support other blocks which form the roof of the temple; the principle of the pier and lintel being embodied in them but without cornice or capital, thus allying the columns with the architectural structures of the later

THE PYRAMID, THE SPHINX AND ITS TEMPLE period*

The magnitude of the pyramids of Egypt has impressed every one who has looked upon them; and yet the beauty and symmetry of the temples adjoining have called forth the admiration of all; as the contrast between the two classes of works strengthens the impression. This is illustrated by the

*The cut shows the veneering on the pyramid the rock below the Sphinx and the buried temple of the Sphinx.

description which is given of the pyramid, written by Mr. Ebers, the famous Egyptologist, as compared with the description of the temple at Karnak, written by Miss Amelia B. Edwards. Mr. Ebers says:

"We stand before the largest of the works of man which as we know the ancients glorified as one of the wonders of the world. Only by a comparison with other structures present in our memory, can any idea of their immensity be missed. While St. Peters in Rome, is 430 ft. high, the great pyramids of Cheops is 482 ft. high, or 52 feet taller. If the pyramid of Cheops were hollow, the great cathedral could be placed within it like a clock under a protecting glass.

Neither St. Stephen's Cathedral of Vienna, nor that of Strasburg, reaches the height or the largest pyramid, and only the new tower of the Cathedral of Cologne exceeds it. In one respect no other building in the world can be compared with the pyramids, and that is, in regard to the mass and weight of the material used in the construction. If the tomb of Cheops were razed, a wall could be built all around the borders of France. If one fires a good pistol from the top, the ball falls half way down its side. "Time marks all things, but the pyramids mark time," is the Arabian proverb."

The following is Miss Edward's description:

The great hall of Karnak and its columns are enormous. Six men standing with extended arms, finger-tip to finger tip, could barely reach around any one of them. The largest column casts a shadow 12 ft. in breadth. The capitol juts out so high above one's head that it looks as though it might have been placed there to support the heavens. It is carved in the semblance of a full blown lotus, and glows with undying colors, colors that are still fresh though laid on by hands that have been dust 3,000 years or more. The beams are huge monoliths carved and painted, bridging the span from pillar to pillar, and darkening the floor beneath with bands of shadow.

Looking up and down the central avenue, we see at one end a flame like obelisk, and at the other a background of glowing mountains; to right and left, and through long lines of columns, we catch glimpses of colossal bas-reliefs lining the roofless walls in every direction. Half in light and half in shadow these slender fantastic forms stand out sharp and clear and colorless. Each figure is some 18 or 20 ft. in height. It may be, that the traveler who finds himself for the first time in the midst of a grove of gigantic oaks, feels something of the same overwhelming sense of awe and wonder, but the great trees have taken 3,000 years to grow and do not strike their roots through six thousand years of history.

Mr. A. H. Keene also says of the construction of the pyramids:

"It was formerly an Egyptian tomb 4 ft. square at the base and tapering up to a point. The Greek term 'pyramid' signifies 'pointed like a

flame of fire.' The pyramids of Egypt are in the first place the tomb of kings. The rise of this type has been ascribed to the 6th or 7th Dynasty, 3400 or 3200 B. C. The Royal pyramids are numerous, but none have been the subject of architectural study except the largest. That of Medum, 400 B. C., seems to have been built over a mastabah, but it was sheathed with masonry, and brought to a point. The great pyramids of Gizeh have been supposed to have gained their great size from continued enlarging and recasing through a long reign. The pyramids are mainly cairns. They are solid masses of stone or brick, but each has a chamber with several passages leading to them which are carefully concealed, while false passages exist which are intended to deceive plunderers."*

The sides of the three great pyramids of Egypt face the four cardinal points of the compass. Cheops measures 750 ft. on each of the four sides. It is 450 ft. in height, and covers an area of nearly 13 acres. Its estimated weight is about 7,000,000 tons.

There were changes in the construction of the pyramids. The first or oldest is the so called step pyramid of Sakkarah. The steps are six in number and vary in height from 38 to 29 feet, their width being about 6 feet. The dimensions are 352x396 feet, and 197 feet high. Some authorities think this pyramid was erected in the first dynasty. The arrangement of chambers in the pyramid is quite special. The claim to the highest antiquity is disputed by some in favor of the "False Pyramid of Medum." This is a step pyramid 115 feet high, and shows three stages, 70, 20 and 25 feet high. This presents the form of the Mastabah more fully than any other pyramid, and shows clearly how the pyramids of Egypt originated. The blunted pyramid of Dashur forms one of the group of four, two of stone and two of brick. The dimensions of these are as follows: 700x700—326 feet high; 620x620—321 feet high; 350x350—90 feet high; 343x343—156 feet high. According to Prof. F. Petrie there is a small temple on the east side of the pyramid of Medum. At sunset at the equinox the sepulchre chamber and the sun were in line from the adytum.

The sphinx near the pyramid of Cheops was oriented true east and may possibly be ascribed to the early pyramid builders. It could only have been sculptured by a race with an equinoctial cult. The east and west orientation is seen at the pyramids of Gizeh.†

It appears that pyramid building ceased after the sixth dynasty but was revived in the twelfth dynasty. Just before the Hyksos period King Amenhotep III. returned to the gigantic irrigation works of the pyramid building of the earlier dynasties. Two ornamental pyramids were built, surrounded by statues, and the king himself was buried in the pyramid near the labyrinth.

*See Stafford's *Compendium of Geography and Travel* "Central and South America," by A. H. Keene, London, Stanford & Co. 1901.

†See *Dawn of Astronomy*, P. 337, by Norman Lockyer.

II. We turn now from the pyramids of Egypt to those of Babylonia, but shall notice the contrast between the two classes. One of the points of difference is found in the manner of orienting the pyramids. Those of Babylonia are oriented towards the solstices, the corners towards the points of the compass. This has been taken by Mr. Norman Lockyer as evidence that the pyramids of Babylonia were older than those of Egypt, as solstitial worship is supposed to be older than the equinoctial.*

He says: "The east and west orientation is chiefly remarkable at the pyramids of Gizeh and the associate temples, but it is not confined to them. The argument in favor of these structures being the work of intruders, is that a perfectly new astronomical idea comes in, as quite out of place in Egypt, with the solstitial rising river, as the autumnal equinox was at Eridu, with the river rising at the spring equinox."

"We are justified from what is now known of the Nile dominating and defining the commencement of the Egyptian year at the solstices, in concluding that other ancient peoples placed in like conditions would act in the same way; and if these conditions were such that spring would mean sowing time and autumn harvest time, their year would begin at an equinox."

There are other evidences to prove that the pyramids of Babylonia were the oldest in the world, while those of Egypt are orientated toward the equinoxes, their sides toward the points of the compass.

The pyramids of Babylonia have a tradition connected with them which goes back to the earliest time. This tradition has been preserved in the sacred Scriptures. Various interpretations have been given to it and to the whole story of the deluge with which it seems to have been connected. According to the celebrated author Ihering, the whole story of the Garden of Eden, the sin of the first pair, the banishment, the contest between Cain and Abel, was a pictorial representation of the progress of society from a primitive condition, up through the various stages. The change from a natural state, where the people fed upon fruits, was followed by the shepherd life, and that by the agricultural or the raising of fruit and grain, a contest occurring between the shepherds and agriculturists all represented by the story of Cain and Abel. The building of the first city was by the agriculturists, but the building of the first Pyramid was to escape the floods to which the valley of the Tigris and Euphrates was subject.

The confirmation of the story is founded on the fact that the first pyramid was actually erected to escape the floods which were so common in the valley of the Tigris and Euphrates. Whatever we may say about the correctness of this interpretation, we must conclude that the tradition at least

*Dawn of Astronomy, p. 366.

favors the extreme antiquity of the pyramids of this locality. The recent discovery by the party sent out by the University of Pennsylvania to explore the ruined cities in the valley of the Tigris, also confirms the theory. The opinion expressed by the chief of the party, Professor Hilprecht, is that the pyramids here were built perhaps as early as 6000 B. C., which would make them two or three thousand years older than those of Egypt. It is true that certain graves have been discovered in Egypt which carry back the date of the first or oldest race to a marvellous antiquity, but the pyramids here were certainly not built before the days of Menes, the first king, and no one claims for his reign a date earlier than 3500 B. C.

It is true that burials which belong to the Stone age have been found in Egypt. They carry us back to a more primitive stage, but the date of the Babylonian pyramids is supposed to be much earlier. The discovery of libraries at Babylonia containing tablets with cuneiform writing upon them carries back the date of the Babylonian civilization much further than that of Egypt and confirms the tradition in reference to the valley of the Tigris having been the original home of the human race.

The fact that the pyramids of Babylonia were built in imitation of mountains favors their antiquity. This confirms the tradition in reference to the ark resting upon a mountain, which shows that the pyramid builders here originally migrated from the mountains. The difference in the construction is to be noticed. The pyramids of Babylonia were ziggurats or towers and not pyramids at all, nor were they used for burial places, but rather the foundation for temples or shrines.

Many differences between the pyramids of Egypt and those of Babylonia may be traced.

1. The pyramids of Egypt were for the most part constructed for tombs and had no buildings upon the summit or in the immediate vicinity. The temple of the Great Sphinx, discovered in 1853 below the level of the sand, was constructed by the pyramid builders. This temple was, however, a tomb as well as a temple. Numerous other tombs of great interest have been discovered near the temples; that of Edtou, the one at Sakkarah, the tomb of Beni Hassen, are supposed to belong to the same period.

2. The pyramids of Egypt were constructed out of heavy blocks of stone which, with incredible toil, were transported from the mountains upon the other side of the river and lifted to their height by mere brute strength. The pyramids of Babylonia were generally constructed out of earth, and were built in terraces; the ends were veneered with stone, pavements of stone being placed on the platforms or terraces, and either palace, or shrine, or temple being placed upon the summit.

3. The pyramids of Egypt were perfect pyramids. They were built in imitation of mastababs or primitive Egyptian houses, or tombs placed upon one another, thus making terraces, but before they were completed the terraces were filled with stone, and the whole was covered with a veneering of polished flint, which made them perfect cubes. The only room or house about them was on the inside or below the surface. The pyramids of Babylonia on the contrary were always built in terraces and were surmounted by a building of some kind, either a palace, a temple, or a religious house, and were never perfect pyramids. They resembled the pyramids of America much more than they did those of Egypt.

4. Another difference is shown in the fact that in Babylonia the pyramids were all orientated toward the solstices, the corners toward the points of the compass. "It is almost impossible to suppose that those who worshiped the sun at the solstice did not begin the year at the solstice, and that those who proposed to arrange themselves as equinoctials did not begin the year at an equinox. Both of these practices could hardly go on in the case of the same race in the same country. We have then, a valuable hint of the equinoctial cult of Gizeh, which in all probability was interpolated after the non-equinoctial worship had been first founded at Abydos and possibly Thebes."

5. We notice another difference between the pyramids of Egypt and those of Babylonia * "One of the oldest pyramids in Egypt is the so-called step pyramid of Sakkarah. The steps are six in number and vary in height from 38 to 29 feet, their width being 6 feet. Some authorities think that this was erected in the first dynasty by the 4th king, but was built after the pattern of a series of mastababs imposed on one another. There are 16 step pyramids in the valley of the Nile.

The question has arisen as to the relative antiquity of the pyramids of Babylonia, some having claimed that those of Egypt were the older, but others have given the precedence to those of Babylonia. The best authority, however, is Norman Lockyer, and he maintains that the pyramids of Egypt were built by an intruding race from Babylonia called the "new race," the name being taken from the fact that it was newly round.

The great pyramids of Egypt were built in the time of the 4th dynasty, but two or three distinct periods had passed before this dynasty began. The first period was marked by a people who were in the Stone age.

The second period was marked by the peculiar burials and the peculiar character of relics. The burial was in the circular grave with an immense number of pottery vessels arranged around the bodies, the deposit indicating that the people lived in circular huts.

The third period was marked by burial in a mastabah or rectangular tomb, built in imitation of the dwelling house of the people, the body being placed in a cellar or well below the house.

The date of the earliest known pyramids in Egypt may be put down as about 3700 B. C. or 4200 B. C. There is conclusive evidence that the kings of Babylon built ziggurats or towers which were in reality step pyramids, as early as 4200 B. C. There was an equality of arts and the possession of similar tools in Chaldea and in Egypt at about the same time.

If this is a correct explanation, then we may regard the pyramid at Babylon as a monument of one of the most important events of history, as well as the reminder of a great convulsion of nature.

This does not, to be sure, fully account for the peculiar manner in which the pyramid was built, nor does it account for the fact that the different terraces bore different colors and were sacred to the different planets, the shrine upon its summit being sacred to the sun.

Least of all does it account for the presence of courts and columns and other peculiarities of construction such as have been disclosed by recent excavations. Yet notwithstanding all the discrepancies, the traditions of the past and the explorations of the present have combined to make the spot a memorable one.

All of these differences seem to confirm the opinion that upon this very spot near the mouth of the Tigris, the earliest civilization appeared, and from this as a center not only the historic but even many of the prehistoric races began their migrations, the tradition of the flood spreading from the center to nearly all parts of the world. It is also the opinion of the best Egyptologists that these and other pyramids in Babylonia preceded those of Egypt, the civilization of this region having reached a high point even when in Egypt the recently found race called the "new race" were in the stage of barbarism which was peculiar to the Stone age, the circular graves and the pottery vessels recently discovered being supplanted by the mastababs and pyramids which the immigrants from the East had introduced.

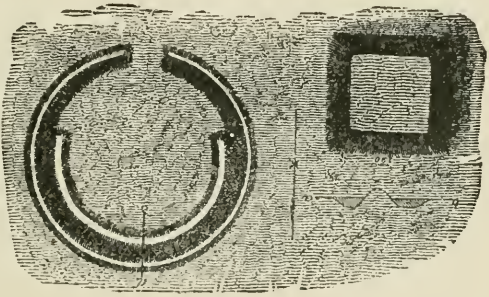
It is then to the pyramids of Babylonia that we look for the earliest tokens of civilization and for the earliest record of history.

III. The pyramids of America will next engage our attention. It is well known that there are many pyramids on this continent. Some of them, constructed of earth, are found in the Mississippi valley, others, made out of stone and earth combined, in Mexico and Central America, still others, made out of stone altogether, in Peru; a great variety of shapes being presented by the pyramids here. It has been the favorite

theory with certain writers, especially the celebrated LePlongeon, that the pyramids of Central America were exactly like the pyramids of Egypt, and were perhaps constructed by a colony from Egypt. In support of this opinion he refers to the various statues which in some respects resemble those found in the valley of the Nile, and claims that even the model of the sphinx has been discovered here. In order to do away with this visionary theory we shall show the probable origin of the pyramids of America.

It was very natural for the people upon this continent to erect pyramids or pyramid mounds for the purpose of raising their houses, and especially the houses of the ruling classes, above the surface, for by this means they could be free from the overflow of the streams, from the attack of wild animals, and from the malaria and heat, which continued upon the surface, and made the nights so uncomfortable, and the people so liable to sickness, especially in tropical regions. The largest pyramids were erected here in the same latitude with those of Egypt and Babylonia, and many of the circumstances were similar, but this does not prove any connection between the builders.

It is certainly easy to trace a resemblance between the platform mounds and pyramid earth works of the Mississippi valley and the various pyramids of Mexico and Central America for they seem to have been built after the same general model, the terraces



PYRAMID MOUND IN OHIO

rising above one another in succession, with stairways or graded ways leading up to their summits upon either side. Many of them were placed inside of enclosures and had their sides oriented exactly as were the temples and pyramids in the central provinces. These platforms were surmounted by different official buildings.

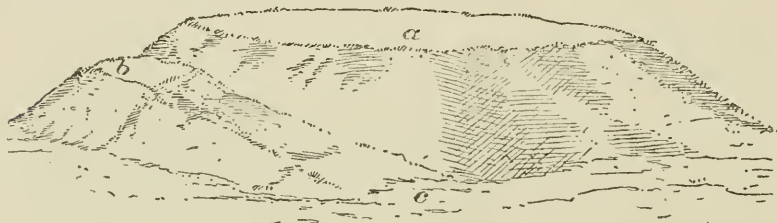
A still more striking resemblance may be found in the so-called Chunkey Yards in the Gulf states, for these were generally placed in the center of the village and were used as the place of amusement for the people, the rotunda being at one end of the public square, and in all these respects resembled the tennis courts or gymnasiums which are so noticeable in Central America the very arrangement of the buildings and the yards suggesting a common origin.

These resemblances however, do not furnish any explanation of the origin of the pyramids in America, nor do they prove that the pyramid builders here have any connection with the

pyramid builders of the old world, but on the contrary they must be taken as another illustration of the law of parallel development, the agricultural life and sedentary state of the mound builders leading them to adopt the same form of religion and the same general customs which were adopted by the pyramid builders in the countries of the East.

It should be said that a theory has been advanced in reference to the pyramids of America which would make them the work of a mysterious race who once inhabited the greater part of the North American continent, and who constructed the platform mounds of the Mississippi valley, and erected the many storied pueblos of the interior, and the lofty terrace pyramids of Mexico, and filled one entire belt of latitude with the tokens of their presence.

This theory, however, would be decidedly misleading, for whatever we may conclude as to the time when this continent was first reached, or as to the direction which the first inhabitants took in their migration, the evidence is that all the struct-

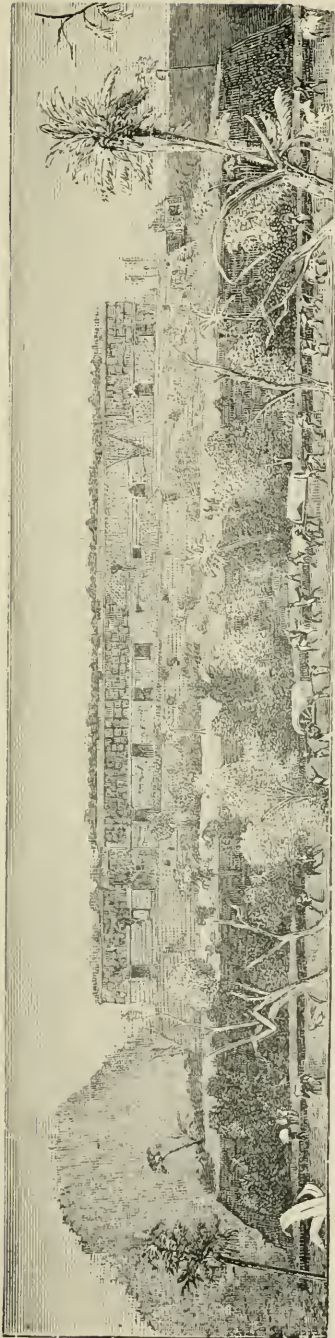


PYRAMID AT ETOWAH.

ures which have thus far been discovered are the works of different tribes and races.

We are to notice, however, that the early stages of architecture are to be recognized on this continent, and what is more, the very influences and causes which led the nations of the East to erect their great pyramids and to make them their chief and most lasting monuments, led the natives of this country to erect their structures which have the pyramidal form. What those influences were is not easily determined. Yet it is probable that the mode of life or occupation, the social conditions, the religious belief and the mythological conceptions had as much to do with the forms of their structures as their mechanical skill had, and to these we must look for our explanation of the pyramids. It is well known that the pyramids of the East were built by an agricultural people who never settled in permanent villages or cities and were generally sun worshipers, and that temples to the sun were frequently associated with the pyramids.

The same may also be said of the pyramids of this continent, for there are no pyramids except in those regions where agriculture abounds, and where sun worship prevailed, but pyramids are the most numerous where sun worship and sky



worship prevailed with the greatest force. Many of the pyramids were to be sure erected under the shadow of great mountains, and there may have been an attempt to imitate the mountains in the size and shape of the pyramids, yet we do not learn that there are any shrines devoted to the mountain divinities, as personifications of the sun and moon and the heavenly bodies were very numerous, and nearly all the shrines and temples, as well as the pyramids, were devoted to their worship. In fact we may conclude that the pyramids of America had their origin in the same causes that led to the erection of the pyramids of Egypt and Babylonia, and that the same religious systems were embodied in them that were embodied in the great structures of the East, also those which relate to religions such as sacred places, priesthoods, native pantheons worship, private religion and religious literature are especially pertinent.

The pyramids of America interest us fully as much as do those of Egypt or Babylonia, though less is known concerning them, their builders, or even their history. It is not claimed that they are as ancient as those of the old world, nor is it maintained that as much labor and expense was laid on them, and yet their form and character and the manner of their erection are worthy of especial study.

Some of these pyramids were built in terraces designed for the support of palaces resembling the one shown in the cut, which represents the governor's house at Uxmal.

It will be noticed in the first place that there were quite three

distinct regions on the continent in which pyramids were common, and three distinct races who were pyramid builders, the Aztecs having built the majority of those found in Mexico, the Mayas those scattered through Central America, and the far famed Incas having built those found in Peru.

It is to be noticed further that the style of building the pyramids varied according to the locality in which they were found, as those in Mexico are frequently placed upon natural elevations and owe their height to this circumstance, while those of Central America were generally built upon the same level, but reached to different heights according to the purpose for which they were designed, those which were to serve for the support of the palaces were built upon terraces spread over a large plat of ground, those designed for temples were compact and small, but reached a height which overtopped all other structures, while those designed for religious houses or for other purposes, varied in size and height.

There were many terraced pyramids scattered through the country on which large buildings were erected resembling those which were common in New Mexico. These, because of their size and shape, were formerly supposed to be communistic houses like the Pueblos of the north, and the theory was advanced that the people lived in the same manner. This, however, has proved to be a mistake, for all the pyramids of Mexico and Central America, as well as those of Peru, were built and occupied by the ruling class. Their very height and size impressed the common people with a feeling of awe for those who were in power and the many ceremonies which were conducted on the summit of the pyramids served to strengthen the feeling. It was a strange use to make of architecture and of art, and yet there was not a stairway which led up to the summit of a pyramid, nor a figure or ornament on the facade of any palace, or an image on any temple that rose above a pyramid, which did not contribute to the power of the priests and kings and increase the superstition of the people.

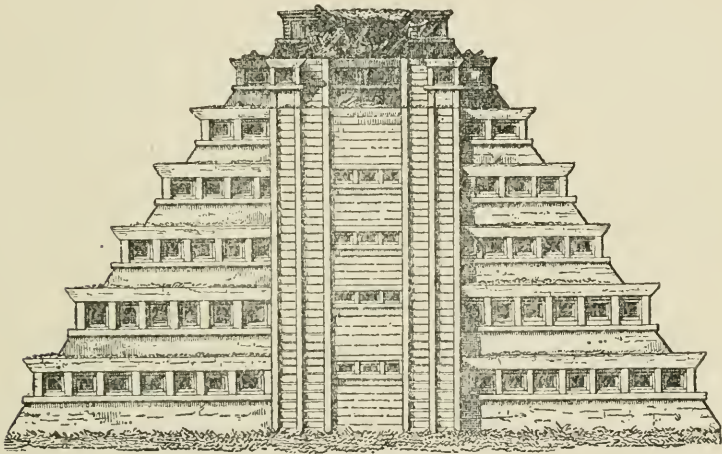
The element of terror was hidden in every ornament which was wrought by the hand of man, and served as a constant guard at the entrance of every temple and palace, the very height of the pyramids on which they were placed making the feeling all the more intense. It was an unconscious influence, for if the sense of the sublime was awakened by the height of the pyramids, the same sense was kept alive by the strange and grotesque figures which appeared on the facades of the palaces and the temples, the very stairways which served as the means of approach being so wrought as to be the most awe inspiring of all.

In this respect we may say that the pyramids of America were in great contrast to those of any other country, for while they were in themselves very plain, and simply served the

purpose of platforms to the temples and palaces, yet the association of the platforms with the buildings upon their summit was so close as to make them appear like one structure. The same spirit that pervaded the decorations of the facade also filled the mass of the pyramids which supported them.

These points are to be borne in mind as we proceed, for it is not to the size or strength of the pyramids that we shall call especial attention, but rather to the peculiar mission which they performed in connection with the temples and palaces which were raised above them, the close combination of the buildings with the masses which supported them making them more interesting as objects of study.

As to the pyramids in Mexico, it is very plain that the majority of them were designed for the support of a temple or place of sacrifice, and as the height of the pyramid would make the ceremony all the more imposing and would give such effect to the sacrifice as to overawe the people and make them feel the power of the priests and kings. Thus people



PYRAMID AT PAPANTLA.

sometimes resorted to the mountains and placed their altars upon the heights which overlooked the valleys and there lighted their sacrificial fires. We referred to one such temple in another place. The following is the account:

They are all situated upon the summit of pyramids, but were probably so placed for the sake of escaping the malaria and heat, and taking advantage of the cool breezes which would sweep over them at their height.

About a hundred and fifty miles north-westward from Vera Cruz, fifty miles in the same direction from Misantla, forty-five miles from the Coast, and four or five miles southwest from

the pueblo of Papantla, stands the pyramid shown in the cut, known to the world by the name of pueblo Papantla, but called by the Totonac natives of the region, El Fajin, "the thunderbolt."

The pyramid stands in a dense forest, apparently not on a naturally or artificially fortified plateau, like the remains farther south. Its base is square, measuring a little over ninety feet on each side, and the height is about fifty-four feet; the whole structure was built in seven stories, the upper story being partially in ruins. Except the upper story, which seems to have contained interior compartments, the whole structure was, so far as is known, solid. The material of which it was built, is a sandstone, in regular cut blocks laid in mortar, although Humboldt, perhaps on the authority of Dupaix, says the material is deposited in immense blocks covered with hieroglyphic sculpture, the whole covered on the exterior surface with a hard cement three inches thick, which also bears traces of having been painted.

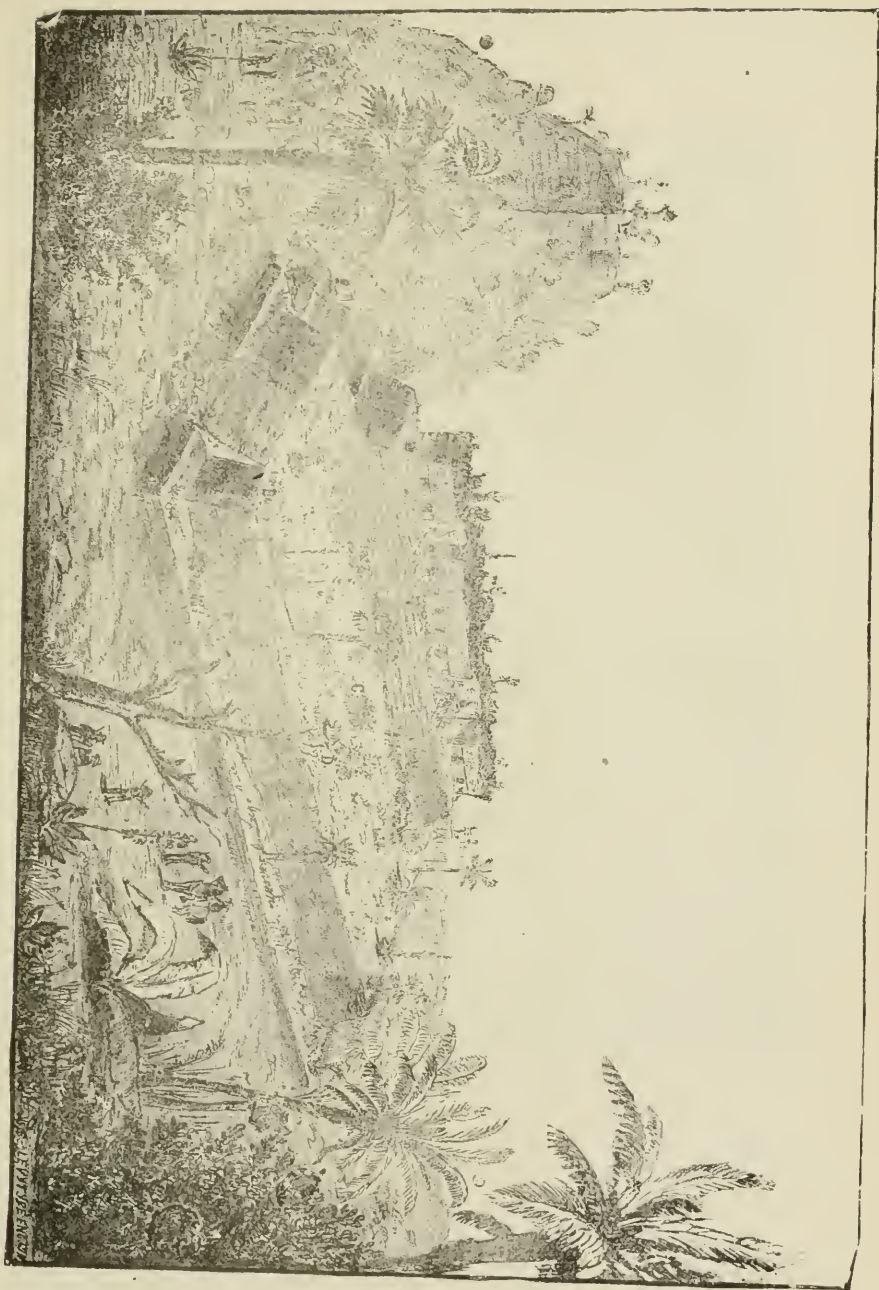
There was a temple at Xochicalco, the hill of flowers; this is a natural elevation, of conical form, with an oval base, over two miles in circumference, rising from the plain to a height of nearly four hundred feet. Traces of paved roads of large stones tightly wedged together, lead in straight lines towards the hills from different directions. We find the hill covered from top to bottom with masonry. Five terraces paved with stone and mortar, and supported by perpendicular walls of the same material, extend in oval form, entirely round the whole circumference of the hill, one above the other. Neither the width of the paved platforms, nor the height of the supporting walls, has been given by any explorer, but each terrace, with the corresponding intermediate slope, constitutes something over seventy feet of the height of the hill.

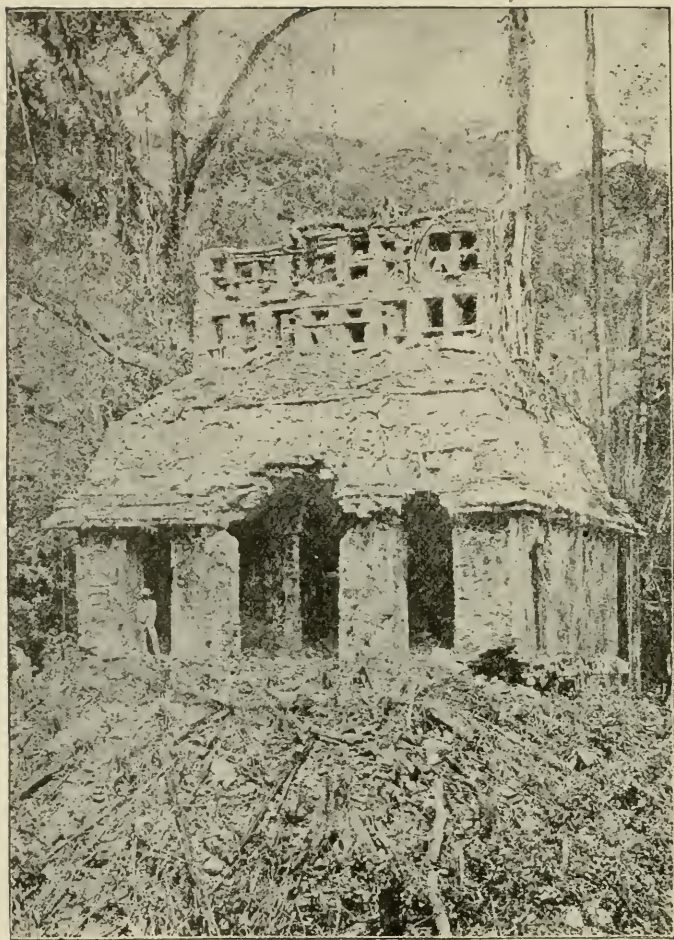
The very fact of its being a pyramid in several stories, gives to Xochicalco, a general likeness to all the more important American ruins. The terraces on the hill slopes have their counterparts at Kabah Cho'tla, and elsewhere; still, as a whole, the pyramid of Xochicalco, stands above all as its architecture and sculpture, presents a strong contrast with Copan Uxmal, Palenque, Mitla, Cholula, Teotihuacan, or the many pyramids of Vera Cruz. It must be remembered that all the graded temples in Anahuac or Mexico, have disappeared since the conquest, so that a comparison with such buildings as that of Xochicalco is impossible.

In the centre of one of the facades, is an open space, something over twenty feet wide, bounded by solid balustrades, and probably, occupied originally by a stair-way, although it is said that no traces of steps have been found among the debris.

The pyramid, or at least its facing, is built of large blocks of granite or porphyry, a kind of stone not found within a distance of many leagues. The blocks are of different sizes, the

PYRAMID AND PALACE AT UNMIL.





TEMPLE AND PYRAMID AT PALENQUE.

largest being about eleven feet long and three feet high, very few being less than five feet in length. They are laid without mortar, and so nicely is the work done that the joints are scarcely perceptible.

It was among the sheltered spots here that, the ancients built their tombs, several of which have been found, being in the form of stone-lined cists. The most prominent peak of this southern range, is at the western end, towering high above the rest, guarding, as it were, the Cuernavaca valley. This mountain is named Chalchihuitepetl, or, hill of the Chalchihuite, the sacred green stone of ancient Mexico and Central America. There are said to be old quarries of it on the southern side of the mountain, which have not yet been investigated.

It was placed on a very conspicuous point upon a mountain height which overlooked a wide valley, the temple itself being built in the form of a pyramid, but with the altar in front instead of upon the top. The temple was divided into two parts. At its entrance were two square pillars, making three doorways, but in the rear was a shrine with hieroglyphics on the walls. There was a fire bed in front of the temple which gives the idea that human sacrifice may have been offered upon this spot, thus making the mountain itself serve the same purpose as an artificial pyramid.*

The eastern end of the temple, shows a structure composed of four parts, the lowest, simply a wide foundation built of rough stones connected together. This serves as a foundation for the second part, the two forming a truncated pyramid. Against the eastern side of the pyramid are the remains of a steep flight of steps; resting upon the lower pyramid is a smaller flight one of the same form. Accordingly we reach the lower platform and, are in front of the old temple, which faced the west. The temple is slightly smaller than the pyramid. Nothing remains of the front wall with the exception of two square columns, showing a wide central door, with a narrow one on either side. This temple is divided into two rooms. At either end of the front room was a narrow bench or seat built against the wall; in its centre was an altar, where the sacred fire was lighted. The importance of this altar, is found in the fact that it was upon the summit of a mountain overlooking a wide valley and was probably used as a place of sacrifice. It is well known that, human sacrifice was practiced by the Aztecs, and that the Teocalli reeked with human gore. The most important feature of the ruin is, the hieroglyphic inscription. This establishes the date of the temple at 1502, A. D.; seventeen years before the entry of Cortez into Mexico. It is one of the few ruined temples which have been discovered, and its discovery shows that the same form of temple architecture prevailed among the Aztecs that had pre-

*Human Sacrifices seem to have been practiced by the Aztecs and perhaps by the Toltecs but not by the Mayas.

vailed among the Toltecs, but the temple among the Aztecs was devoted to human sacrifice.

The pyramids of Central America are similar to those of Mexico in many respects, and yet differ enough to warrant a separate account of them.

The cities here, are all very much alike. There was, in each a palace, which was generally arranged in a quadrangle, and furnished with courts and plazas, having wide terraces or platforms, in front of them, while the temples, were single buildings, placed on the summit of a lofty pyramid and, were approached by stairways, some of which were in the shape of serpents, whose heads projected beyond the stairway. There was a slight difference between the temples of the Mayas and Nahuas, but the difference consisted more in the ornamentation than in the construction.

Bancroft says: "Having fixed upon a site for a proposed edifice the Maya builder invariably constructed an artificial



PYRAMID AT IZAMAL.

elevation on which it might rest. If it was a palace or a Nunnery so called, or some other public building, the elevation would consist of a series of wide terraces and platforms, which were surmounted by the buildings which were generally a single story in height, but so covered with heavy cornices and entablatures as to make them appear to be at least two stories in height. The tower in the centre, often arose to a height of three and four stories, thus giving them an imposing appearance. The palaces were generally long buildings, and had many doorways, some of which opened outward toward the terraces; others inward, toward the court."

"All of the pyramids are truncated; none forming a point at the top. A few of them have been found to have contained tombs, which were probably the tombs of kings or priests,

Some of the temples have tombs in the lower stories, with stairs leading down to the chambers. The edifices supported by the mounds, were built upon the summit platform, and, generally, cover the platform with the exception of a narrow esplanade around them. The palaces are built in receding ranges, one above another, on the slope, and are quite imposing in their appearance. One building usually occupies the summit, but in several cases, four of them enclose an interior court



TEMPLE OF THE MAGICIANS.

yard. The buildings are low and narrow. Thirty-one feet is the greatest height; thirty-nine feet the greatest width; three-hundred thirty-two feet the greatest length. The roofs are flat, and like the floors, covered with cement."

The walls are in proportion to the dimensions of the building, very thick, usually from three to six feet, but sometimes nine feet. The interior has generally two, rarely four, parallel ranges of rooms, while in a few of the smaller buildings an uninterrupted corridor extended the whole length. Neither rooms nor corridors ever exceed twenty feet in width or

length, while the ordinary width is eight to ten feet, and the height fifteen to eighteen feet; sixty feet is the greatest length noted. The walls of each room rise, perpendicularly, for one-half their height and, then approach each other by the stone blocks overlapping horizontally to within about one foot, the intervening space being covered with a layer of wide flat stones, and the projecting corners being beveled off to form a straight or rarely a curved surface.

This shows the general characteristics of the various pyramids and palaces but we shall need to take specific cases to understand them fully. We have given a number of cuts which illustrate the different pyramids, especially those on which temples were erected. One of them represents the pyramid at Izamal which Charnay visited and has described.

He says: "The great mound is called Kinich-Kakmo 'the sun's face with fiery rays,' from an idol which stood in the temple crowning its summit. The monument consists of two parts, the basement, nearly 650 feet long, surmounted by an immense platform, and the small pyramid to the north. Facing this to the south was another great mound. The third pyramid to the east supported a temple dedicated to Zamna, the founder of the great Maya Empire. The fourth pyramid to the west had on its summit the palace of the 'commander-in-chief of 8000 flints.' On its side near the basement, consisting of stone, laid without mortar, stood the gigantic face reproduced by Stephens. It is 7 feet 8 inches high. The features are rudely formed of small rough stones and afterward covered with stucco. On the east side is the colossal head 13 ft. high, the eyes, nose, and under lip formed of rough stones covered over with mortar, while double spirals, symbols of 'wind or speech may be seen, similar to those in Mexico at Palenque and Chichen Itza."

The pyramids and palaces at Uxmal are also worthy of notice. They have been described by different writers, among them Mr. J. L. Stephens, Charnay, Mr. W. H. Holmes, Mr. Bancroft and others. Mr. Holmes has furnished a panorama which shows the number and shape of these pyramids, and a general description of them from which we make brief extracts:

"The pyramid Temple of the Magicians (A); the Nunnery quadrangle (B); the Gymnasium (C); the House of the Turtles (D); the Governor's palace (E); the House of the Pigeons (F); and near it the massive pyramid (G); also the temple crowned pyramid (H); and a group consisting of two pyramids (I); and further away ruined masses."

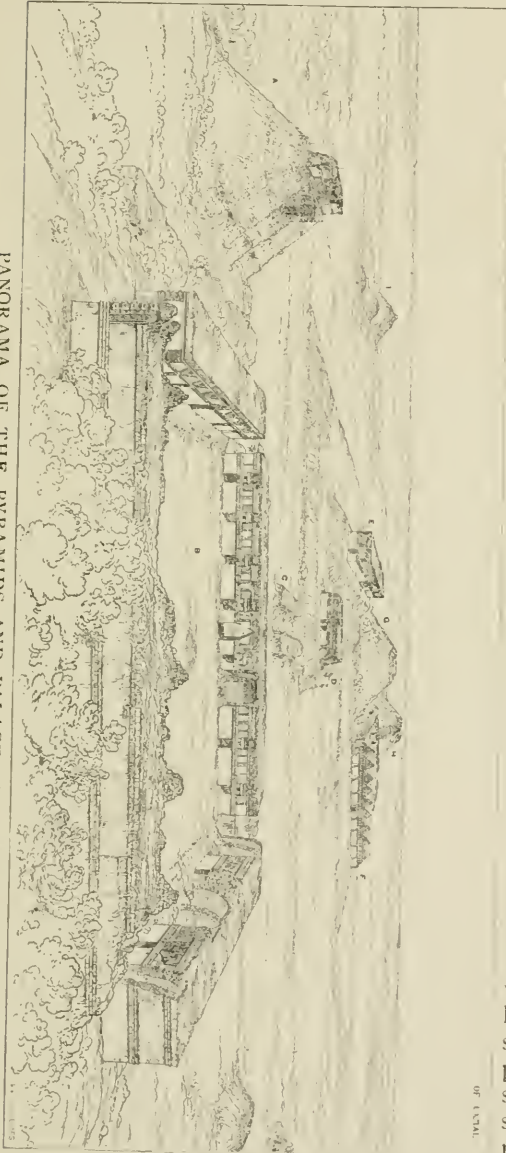
A pyramid at Uxmal is described by Charnay but he calls it the Dwarf's House. He says: "It is a charming temple crowning a pyramid with a very steep slope 400 feet high. It consists of two parts, one reared on the upper summit, the other a kind of chapel, lower down, facing the town. It was richly ornamented and presumably dedicated to a great deity. Two stairways facing east and west led to these buildings."

Of this House of the Magicians (A) Mr. Holmes says: "This temple may well be regarded as the most notable among the group and is the first to catch the eye of the visitor. The temple which crowns the summit is some 70 feet long by 12 feet wide and contains three rooms the middle one being longer

than the others.

The Nunnery quadrangle (B) he says, is among the best known specimens of Maya architecture. Four great rectangular structures, low, heavy and formal in general conformation, stand upon a broad terrace in quadrangular arrangement. The terrace measures upwards of 300 feet square. The four great facades facing the court are among the most notable in Yucatan and deserve especial attention at the hands of students of American art. Of the Governor's House he says:*(E) "This superb building crowning the summit is regarded as the most important single structure of its class in Yucatan and for that matter in America. It is extremely simple in plan and outline being a trapezoidal mass some 320 feet long, 40 feet wide and 25 or 26 feet high. It is partially separated into three parts, a long middle section, and two shorter sections, with recesses leading to

PANORAMA OF THE PYRAMIDS AND PALACE AT UUNAL.



OF UUNAL.

*The plate represents the Governor's House and the House of the Magicians.

two great transverse archways. The front wall is pierced by nine principal doorways and by two archway openings and presents a facade of rare beauty and great originality."

"One of the grandest structures in Uxmal is the great truncated pyramid (G) seen in the panorama rising at the southwest corner of the main terrace of the palace. It is sixty or seventy feet in height, and measures, according to Stephens, some 200 ft. by 300 ft. at the base. This author described a summit platform 65 feet square and three feet high, and a narrow terrace extending all around the pyramid fifteen feet below the crest. The surfaces seem to have been richly decorated with characteristic sculptures."

Of the House of the Pigeons (F) he says: "This unique structure is a remarkable quadrangle which could appropriately be called the Quadrangle of the Nine Gables. The court of this quadrangle is 180 feet from east to west and 150 from north to south. Here was a great building of unusual construction and size with an arch opening through the middle into a court bearing upon its roof a colossal masonry cone, built at an enormous expenditure of time and labor."

The pyramids at Palenque are also described by various authors, Del Rio, Dupaix, Waldeck, Stephens, Charnay, Bancroft, and Maudsley. Mr. Holmes has drawn a panorama of this city with its ruined palaces and temples.

He says of the pyramids: "There are upward of a dozen pyramids of greatly varying style and dimensions, eight only retaining the remains of their superstructures. Some are built on level ground and are symmetrical, while others are set against the mountain sides. With respect to the stairways by which the pyramids were ascended Stephens and others seem to convey the idea that the temple pyramids had stairs on all sides covering the entire surface. As stair builders the Palenquians were superior in some respects to the Yucatecs. Some of the short flights which lead from the courts to the adjoining galleries are of special interest."

CHAPTER XI.

DEFENSIVE ARCHITECTURE IN AMERICA.

The defensive structures of America form one of the most interesting subjects of study. The correlation of these works to the natural surroundings, the different grades of architecture exhibited in them, the similarity of their forms and characteristics in the different sections, and their manifest adaptation to the use intended, make these especially instructive. We propose to describe these works in the present chapter, but especially in their relation to the ancient village life.

It would be easier to divide the prehistoric works of the continent according to geographical lines, and treat all the structures of each section separately, without regard to their use or object, but as we have already spoken of this subject in the previous chapter, we shall in this, select the one class which was devoted to the purposes of defense and confine ourselves to it, making the defenses wherever they are found the special object of study.

There are certain general points which are to be considered before we proceed to the description of any specific work.

1. The geographical distribution. It will be understood that defensive structures are scattered all over the American Continent, and were as prominent here, as in other parts of the world. They were, in fact, more common during the prehistoric times, than they are at present; for society was then divided into tribes, and tribes into clans. Each tribe occupied but a small extent of territory, and as the tribes were often in conflict, it was necessary for them to provide defenses against one another.

There were occasionally confederacies, which covered a larger amount of territory, but no confederacy was strong enough to keep its own members from occasional conflict. What is more, there was so little certainty that either confederacy or tribe would bring defense to the people, that each village was obliged to protect itself; and so the military was identical with the village architecture, or, at least, formed an essential part of it.

The material varied according to the topography, for there was always a remarkable correlation between the works of the people and their natural surroundings, and the methods of their defense varied according to the character of the region. The illustrations of this are numerous. Forts, which were constructed out of massive earth walls, appear in

the midst of the rich valleys of the Interior, and are scattered over the prairie region. In the hill country, forts were sometimes constructed of earth, sometimes of stone. In the Gulf States pyramids of earth were erected, which served both as refuges from high water and as defenses for the people. On the Great Plateau of the West, the fortresses and fortified pueblos were constructed almost altogether of stone, and were made to protect a large number of people. In the far Southwest, stone pyramids were common, and on their summits temples and palaces were erected; while the common people lived on the level, but gathered about the pyramids and protected them from invasion, by their numbers.

2. The architectural skill which is manifest in the defensive works, is, also, an important point, and the one to which we shall need to give the most attention. We might naturally suppose, that this would be more thoroughly displayed in the defenses, than in any other class of structures, as the military necessities would involve much outlay of labor and exercise much strategic power. Military architecture was always distinguished in prehistoric, as well as in historic times, by this peculiarity: that it protects people in masses, and not as individuals. If society is not collected, it compels a concentration at certain points, especially in the time of danger, and then makes personal defense a part of the protection given to the people. In the prehistoric age this concentration seemed to always prevail, for the residences were mainly in the village enclosures, and, if the village defenses were not sufficient, the people would fly to some "strong-hold," and there mass their forces in protecting themselves from invasion.

It has been questioned whether any primitive people was capable of establishing a separate fortress, and making this their refuge in times of danger. This has been disputed in the case of the Pueblos and Cliff-Dwellers, and every structure which has been regarded as a fortress, has been pronounced by certain writers to be merely temporary farming shelters; but the facts prove the contrary. There are separate forts which were places of refuge for the villagers of the vicinity, both among the Mound-Builders and the Cliff-Dwellers, and among the tribes of the Southwest. There were, to be sure, various devices by which the villages could be warned, and so provide for their safety, either by flight or by the rallying of their forces and setting up such defenses as they had, or by removal to some separate fortress.

3. Another point to which we shall call attention, will be that in the prehistoric times there was no military class, separate and distinct from the common people; while there were warriors and war-chiefs and councils of war, and particular rites for the initiation of the young men as warriors, yet there was no such thing as a standing army, or even a garrison; and the equipments for war were always distributed among the people, instead of being gathered into an arsenal or kept in some place

devoted to the purpose. The organization of society was sometimes on a war basis, but it was seldom permanently so, and when it was, it was a matter of volunteering and personal choice, rather than of political authority or public constraint. There were different grades of society in prehistoric times, and the military equipment always increased as the grade advanced; but it remained for the historic age to introduce the standing army and the permanent equipment for war, as well as the prevalence of landed estate. The establishment of military schools and the constant training of the youth for war, appeared at an early date in history. These came in with civilization, and were essential features, for the advantages of peace were felt to be so great that they must be defended by war.

The progress of the people may be studied in connection with the military works, for a rude people would be likely to have a rude method of defense; while a more advanced people would have a more elaborate and complicated system.

4. In reference to the progress of military architecture in America, we shall find various illustrations, especially, as we pass over the different parts of the continent. This progress, also, does not seem to have been made so much in one locality, as by the people as a whole. The continent may be divided into districts, each one of which presents a style peculiar to itself; but one which represents the condition of the people who inhabited the district; the fishermen of the Northwest had one kind of defense; the hunters of the Northeast, especially those situated along the line of the Great Lakes, having another; the agricultural people formerly living along the Ohio River and the Gulf States, a third; the people who occupied the Great Plateau of the West, such as the Cliff-Dwellers and Pueblos, had a fourth style; those who were, at the time of the Discovery, inhabiting Mexico, a fifth style; those in Yucatan and Central America, a sixth, and those who dwelt among the mountains of Peru, a seventh; the intermediate stages were represented by the people who dwelt on the borders of each of these districts.

5. The most interesting fact, is that there are so many analogies between the methods of defense which were common in America in prehistoric times and those which were used in the historic lands. For the same belts of latitude are not only characterized by people in the same grade of culture, but by defensive structures which have the same architectural peculiarities. Those in the north of Europe, in the forests of Britany, which have been described by Tacitus and Cæsar, and which Cæsar took in his campaign, resembled those which were found in the forests of New York, and were occupied by the famous Iroquois Confederacy; and even the vitrified forts, described by Cæsar, have their analogies in the ancient earth-works of Wisconsin. It is well known that there were towers scattered over the shores of the Mediterranean, and that others resembling them are still found in Scotland and Great Britain,

These are supposed to be watch towers, and must be numbered among the defenses of ancient times. It is very remarkable, that there are towers resembling these, still standing, though in ruins, near the ancient cliff dwellings of the deep interior, and that there is about as much mystery concerning their use and the people who occupied them, as there is about those in Sardinia and Phœnicia.

The walled towns and ancient citadels, which were common in Palestine and are mentioned in the Scriptures, have also their correlations in America, especially among the tribes which formerly dwelt on the Gila in Arizona, and have left behind them the remarkable ruined houses and fortresses on nearly every high mesa.

The ancient cities of the East were generally surrounded by walls, and contained many terraced pyramids, on the summits of which were the palaces and temples, which became so celebrated in history. There were cities in Central America, in prehistoric times, which resembled these, and even the means which were adopted for their defense were remarkably similar to those which were common in Oriental countries.

6. It is to be noticed, that in all primitive society the village community is the unit, and is the chief object of defense; but, in most cases, the villages constitute the abodes of the clans, but as the clans are organized into tribes, the defense becomes common. For society was here divided into villages, and the defense was chiefly for the people, as they were gathered into villages, rather than for the people as scattered into separate houses, or even as clustered into cities and defended by forts which were erected at strategic points. Occasionally there were defenses which extended beyond the village and embraced a number of villages, as the combination of clans into a tribe rendered it important for the clans to make a common cause, and cover their tribal habitat with defenses which would protect all the people, and in this respect would resemble the defenses which are common in modern days.

Still, there is a great difference between the defence of a nation and that of a tribe, for the first implies the existence of landed estate, and is designed to protect the property, as well as the people; but with the tribe, the object was to protect the tribal territory, not because it was property, but because it was the abode of the people.

The law of consanguinity and the communistic system made the village a very important factor of society, but the law of defense made it even more important still. The village was the unit, as it contained the gens, just as in modern society, the house is the unit, as it contains the family, the gens taking the place of the family in the prehistoric age.

The village was defended rather than the land, the provision for defence of the land being found in the defenses of the villages. The different members of the clan were, to be sure, affiliated, and were interested in having a common defense,

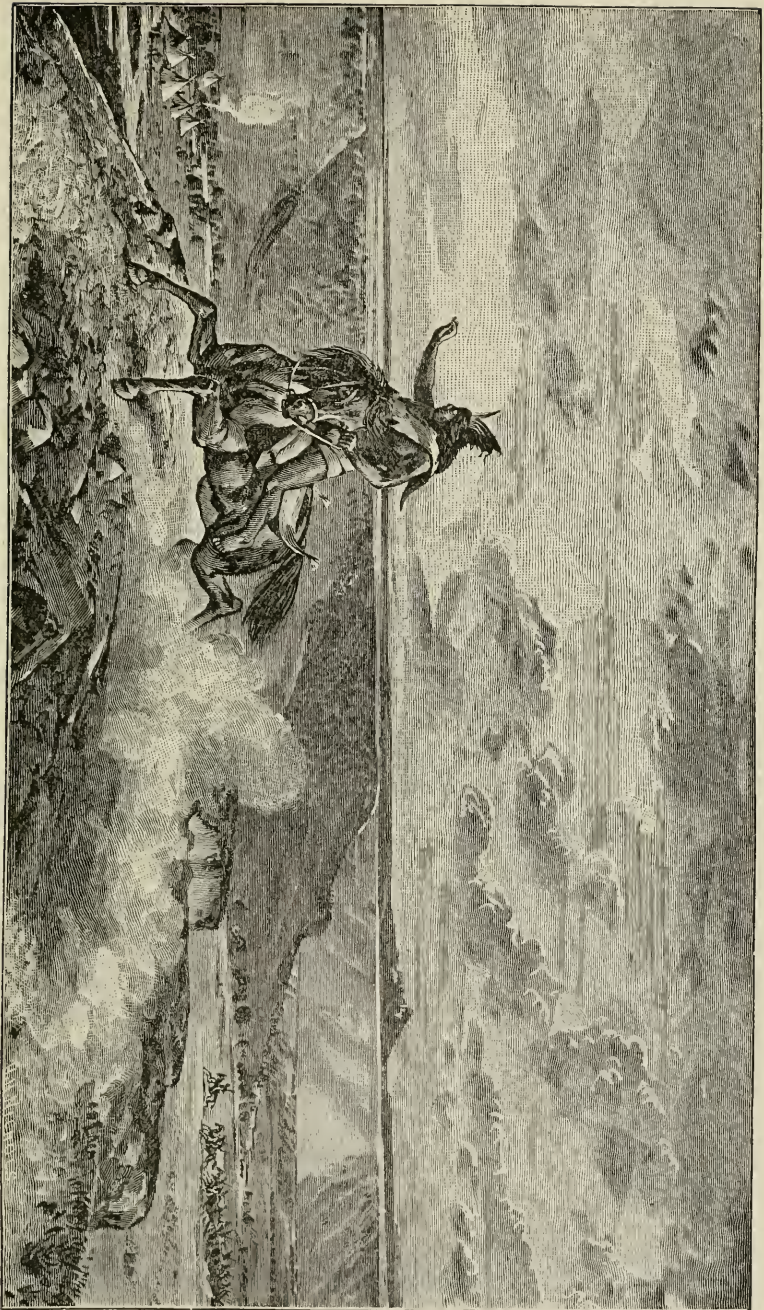


Plate I.

and so a system of tribal defense was established, somewhat different and separate from that of the village, but the main defense was in the village, the walls or enclosures very rarely embracing more than a clan or a phratry, other clans and phratries being gathered in other enclosures.

In studying the prehistoric villages of America we have found that there were three or four methods of defense among them which are especially prominent, and to these methods we would call attention in this paper. These methods, it appears, were common in all parts of the country, and though the structures differ in many other respects, yet the same uses are manifest in them, and so the analogies between the different works appear.

The first method of defense to which we shall call attention is that which appears in the extensive system of signal and observatory stations which is everywhere manifest. We have already called attention to this system in connection with an article on the Emblematic Mounds, but we would here consider it more especially in its connection with village life, and therefore shall take the liberty to repeat a few of the cuts, using them to illustrate a new point. The fact is that a system of signals existed by which the villages could communicate, and among some of the races this system became very elaborate. The extent of this signal-system was, of course, dependent upon the extent of the tribe or the confederacy to which the villages belonged. In some tribes the signal system would extend over a whole state; in others it would be limited to the valley of a single river and in a few cases to a small river. Where confederacies existed, the signal system would extend over the whole grounds occupied by the confederacy.

The study of this signal system, then, should first engage our attention; after that, the provisions made for public defense in more limited localities, and the characteristics of each system. This, then, is the plan according to which we shall treat the subject. We shall first consider the signal system as it prevailed among all classes of prehistoric people. We shall next consider the combination of this system, with that of defensive enclosures, and shall also consider the location of the enclosures, especially as this location shows evidence of defense. The consideration of the village enclosure with the provisions made for defense in the very habitations, will form the conclusion of the paper.

I. Let us then consider the defense which the signal system gave to the villages. This system has been studied by others, and many things have been brought out which are new and of great importance. Here we acknowledge our indebtedness to



Plate II.

Col. Garrick Mallery, Dr. W. J. Hoffman, W. H. Holmes, and others. We present a few cuts taken from the last report of the Ethnological Bureau, which illustrate one method of signaling a village in the time of danger.

We call attention to Plate I., as illustrating the habits of the present tribes of Indians. Their custom is to station a sentinel at some high point where he could overlook the country, and where the approach of an enemy could easily be seen. By the sign-language the tidings can be given, and alarm be spread a great distance. The horsemen had a way of riding in a circle, so that they could be seen in all directions, and the sign was easily understood. Another method is to build fires upon prominent points, so that the smoke could be seen by day or the flame by night, and the warning be given in this way.

Plate II. illustrates the use of fire in signals. This particular cut shows the signal which was given to convey tidings of victory, but similar signals were given also as warnings. The natives have a method of signaling by fire, which is peculiar to themselves. The Dakotas, for instance, mix their combustibles so as to cause different shades of smoke; using dried grass for the lightest, and pine leaves for the darkest, and a mixture for intermediate shades. These with their manner of covering a fire with their blankets, so as to cause puffs of smoke, or of leaving the smoke to rise in unbroken columns, gave to them a variety of signals. Sometimes a bunch of grass was tied to an arrow and lighted, and shot into the air.* The tribes of the south-west signal by this means. The Aztecs signaled to each other by fire during the siege of the City of Mexico.

There are many signals among the tribes which are used in case of victory, and others for hunting purposes, and still others for purposes of recognition, but those for defense are the most important. We give a cut illustrating the method by which the natives now make signs to one another for the purpose of recognition (see Plate III.) The same custom of stationing sentinels on prominent points as look-out stations, has been long prevalent. Circles of stones are often found upon elevated points of land, where a good view of the surrounding country can be obtained. These circles are common upon the Upper Missouri, among the Dakotas in Arizona, among the Hualpai, among the Pah Utes of Nevada, in the Sho-Shonee county, in Wyoming, and in many other places of the far west. Frequently the ground around these watch stations is literally covered with flint chippings, as it was the

*See reports W. Hoffman, U. S. Geological Survey for 1877, page 474.



custom of the sentinels to spend their time in making bows and arrows while watching.

This signal system still prevails. It is more prevalent in an open country like the plateau of the west, and yet it probably prevailed in ancient times, in the region east of the mountains. Traces of it are seen among the Moundbuilders.

2. This leads us to a consideration of the signal system of the Moundbuilders. We have already referred to this, and have given cuts illustrating it.* The system prevailed among the Moundbuilders throughout the entire valley of the Mississippi, and observatory mounds are very common. They are to be distinguished, however, from another class, as this class was used for the purposes of defense, while another was used for the purpose of watching game.

The distinguishing points of the observatories designed for village defense are as follows:

(1) The signal station designed for defense is generally a mound located on a prominent point, in close proximity to an enclosure, and is so connected with other observatories that signals can be easily exchanged. On the other hand the outlook for a game-drive may have a more extensive prospect, but takes in the wide range of country without regard to the strategic points. To illustrate; the single isolated mound, called the Henderson mound, near Beloit, Wis.,† commands an extensive view in every direction, and just such a view as would be fitted for the discovery of buffalo herds, as they might come over distant hills and approach the river, the prairies offering no barrier to the sight. On the other hand the village enclosure at Aztalan, forty miles to the northward, on a branch of the same river, the Crawfish, has observatories or lookouts on all the hills surrounding.

Situated in the midst of the amphitheater of hills, this ancient capital was well defended. A cordon of signal stations surrounded it, while the lofty truncated pyramid in the enclosure commanded a view of every point. The signal stations on the hills commanded other views at a great distance, so that no enemy could come within miles of the spot without being seen. A similar system of outlooks may be seen surrounding the ancient capital at Newark, which was similarly situated in the midst of a natural amphitheater, and the observatories were located on the hills surrounding. It has been stated also that observatory mounds are located on all the hills in this region, forming lines between this center and other prominent though distant points. A line has been partially traced from

*See AMERICAN ANTIQUARIAN, Vol. III., No. 2.

†See Article on Moundbuilders, in AMERICAN ANTIQUARIAN, Vol. II., No. 3, also Vol. III., No. 2.

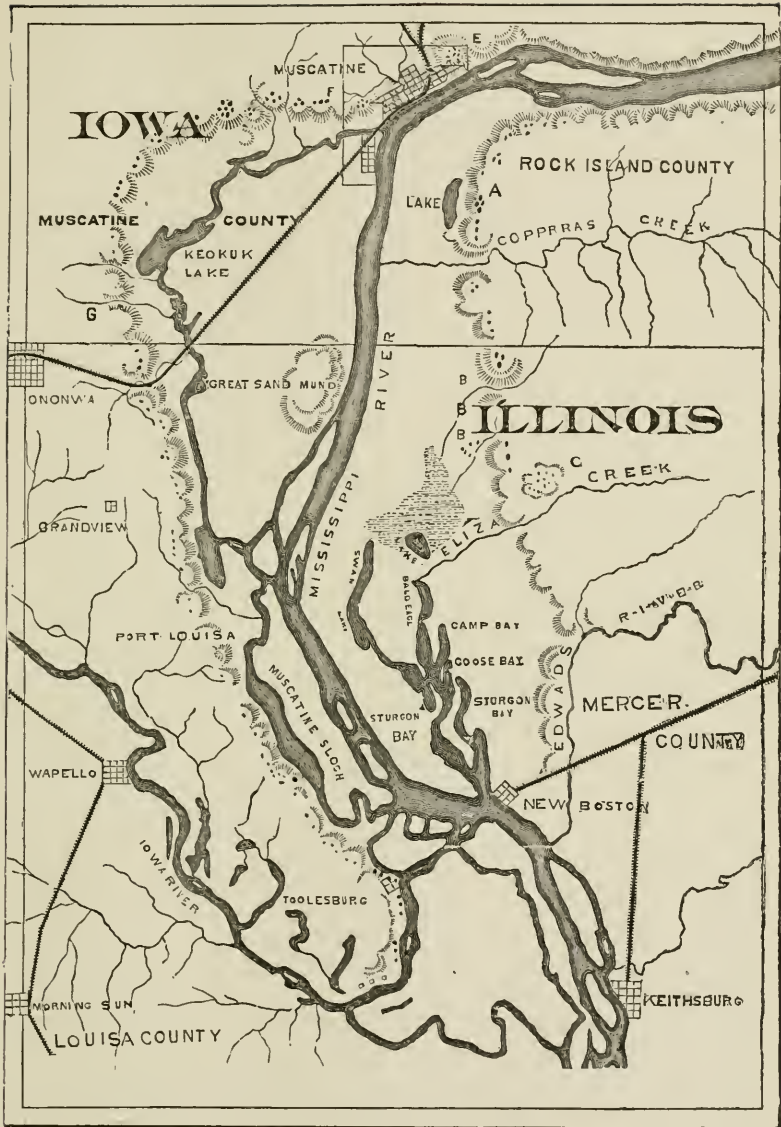


Plate IV.

Mt. Vernon to Newark, the large mound in the cemetery at Mt. Vernon being one of the series.

(2.) The combination of signal stations or observatories with beacons is evidence of a village defense. There are traces of fires on many of the lookout mounds. Many of the supposed beacons may indeed have been burial places, and it would appear as if the burial mounds were sometimes used as watch stations, or as beacons. We give here a map of the mounds at Muscatine to illustrate this point. It will be seen from this that the beacons were located all along the banks of the river, making a complete cordon of signal stations. Many of the mounds on this map have been opened and prove to be burial mounds, but their location on the bluffs surrounding the ancient lake illustrates not only the use of burial mounds for beacons or signals, but also shows how prominently situated the villages were.

(3.) Another peculiarity of the observatories for defense is, that they are some times placed upon very high points, and command the view of other points at a great distance. This idea is given by Dr. Lapham, in connection with Lapham's Peak, a high knoll in Washington county, which commands a very extensive prospect for miles in every direction. Dr. J. W. Phené, in his visit to this country recognized the same in connection with the great serpent mound in Adams county, Ohio. He states that this work is located on an eminence, from which a view can be had of Lookout mountain, in Hancock county, twenty miles away. The same has been observed by the author in connection with the works at Circleville. The great mound at Circleville was sixty feet high, and commanded a view of Lookout mountain, twelve miles to the south of it. On this mountain an observatory was located which commanded a view of the works at Hopeton, situated just below, and the works at Chillicothe, twenty miles to the south of it. It is maintained by E. G. Squiers, that such a series of lofty observatories extend across the whole States of Ohio, of Indiana and Illinois, the Grave creek mound on the east, the great mound at Cahokia on the west, and the works in Ohio filling up the line. Other persons who have made a study of the works along the Ohio river, maintain that there is a series of signal stations running up the branches of the rivers, such as the Scioto, the Great and Little Miami, the Wabash, and other rivers, and that all the prominent works through Ohio and Indiana are connected by a line of observatories. This net-work of signal stations is interesting if studied in connection with the village enclosures; as there are many scattered throughout this whole region.

Beacon fires were frequently lighted on the walls of the defensive enclosures, and many elevated points within village enclosures were also used for the purpose of signaling distant places, so that we cannot confine the signal system to mounds or to isolated stations, though as a general rule the signal system was outside and supplementary to the village enclosure.

We would refer here to the fact that in the ancient fortification at Bourneville, O., there was a rocky summit which overlooked a great valley below, on which traces of beacon fires have been discovered, and that upon the walls of the enclosure at Fort Ancient traces of fire have also been discovered.

On the other hand there are many villages where the location of some lofty point near by would give great opportunity for exchanging signals either by fire or smoke for great distances. Many such points are seen in different parts of the country.

Messrs Squiers and Davis mention the fact that between Chillicothe and Columbus, in Ohio, not far from twenty of these points can be selected, the stations so placed in reference to each other that it is believed that signals of fire might be transmitted in a few minutes.

On a hill opposite Chillicothe, nearly 600 feet in height, the loftiest in the entire region, one of these signal mounds is placed. A fire built upon this would be distinctly visible for fifteen or twenty miles up, and an equal distance down the valley of the Scioto, including in its range the Circleville works, twenty miles distant, as also for a long way up the broad valleys of the two Paint Creeks, both of which abound in the remains of ancient villages. In the map of the Miami valley a similar position may be observed, and similar mounds occur along the Wabash, the Illinois, and the upper Mississippi, showing how extensive this signal system was, at the same time showing how intimately connected it was with village residence.

Rev. J. T. McLean has traced a line of signal mounds from Fort Ancient to the Miami River, and the writer has discovered that the great Miami Mound was so placed that signal fires could be seen for many miles up the Miami River in both directions, and connected the villages scattered along the different rivers to the east with others far to the west. He has also traced signal stations scattered along the bluffs of the Mississippi River from the city of St. Paul to St. Louis, and found that there were sometimes double and triple lines which connected these with others in the interior and that every high point was furnished with signal stations. Others have traced a similar system extending up the Missouri River, so that we may conclude that there was a network of these stations on which beacon fires could be lighted all over the Mississippi valley; though it is probable that they were used by different tribes, and that each tribe and each confederacy resorted to the same means for defense.

Along with these signal stations there was another class of ancient defenses,—a class which consisted of a combination of signal stations and fortified enclosures. There were several classes of enclosures. We shall only mention three varieties:

(1) The enclosures which were used by the warlike tribes, which were situated along the chain of the Great Lakes, through the state of Ohio into New York State. These have been described by various explorers and archæologists. Mr. E. G. Squiers has described those in the state of New York; Col. Charles Whittelsey has described those along the northern part of the state of Ohio, at Conneaut, Ashtabula, Painesville, and on the Sandusky River. The writer has visited the same localities and can testify to the correctness of the statements. Dr. Hill of Ashland, Ohio, has discovered forts within sight of



CHAMPLAIN AND THE IROQUOIS.

one another, through the whole length of Cuyahoga River, situated on tongues of land which would give distant views.

(2) There was a class of hill forts scattered over the region on either side of the Ohio River, which were probably occupied by different tribes; some of them were undoubtedly places of last resort for the people who dwelt in the villages, and served as defenses for the numerous villages scattered along the valleys. There were hill forts also as far south as Tennessee and Kentucky. Some of them were constructed out of stone, others had earth walls; but all were furnished with signal stations, as well as with walls and gateways.

(3) There were fortified enclosures along the Cumberland and Tennessee Rivers which were occupied by the Stone Grave people. They were furnished with extensive earth walls, and

possibly stockades were erected. The signal station was connected with them, but the burial places were within the enclosures. Stone forts were found also in the Gulf States, some of them upon the mountains.

The next method of defense was that secured by the erection of timber stockades, generally upon the hill tops. This was the method employed by the Iroquois, as well as by the various tribes situated along the Atlantic coast. Champlain found one of these stockade forts near the banks of the St. Lawrence, and had his first encounter with the Iroquois near it. Another stockade fort was situated on the southern part of Lake Champlain, near Ticonderoga. Here the Indians gathered with their boats constructed out of bark, but the French had boats of a superior style; the Indians were frightened at the discharge of fire arms and so were defeated. There were many such forts scattered through the state of New York. Champlain found the Iroquois entrenched in such a stockade fort at Onondaga. This fort was provided with platforms on the inside, on which the defenders stood. There was a stream of water on the outside which protected the fort from fire, and also repulsed the assailants. Champlain constructed an elevated platform, resembling those common in medieval times, and placed men armed with cross bows and fire arms on the platform, and was thus able to dislodge the Indians. Stockade forts like this were found by Cartier at Hochelaga, near Montreal. It was near one of these stockade enclosures, at Mouvilla that De Soto experienced his first defeat.

The villages in Florida were surrounded by stockades. The houses were constructed in about the same way; the timbers were set upright, making a circle, and were covered with a conical roof, which was thatched. There were, however, villages along the Atlantic coast and in New England which had no stockades.

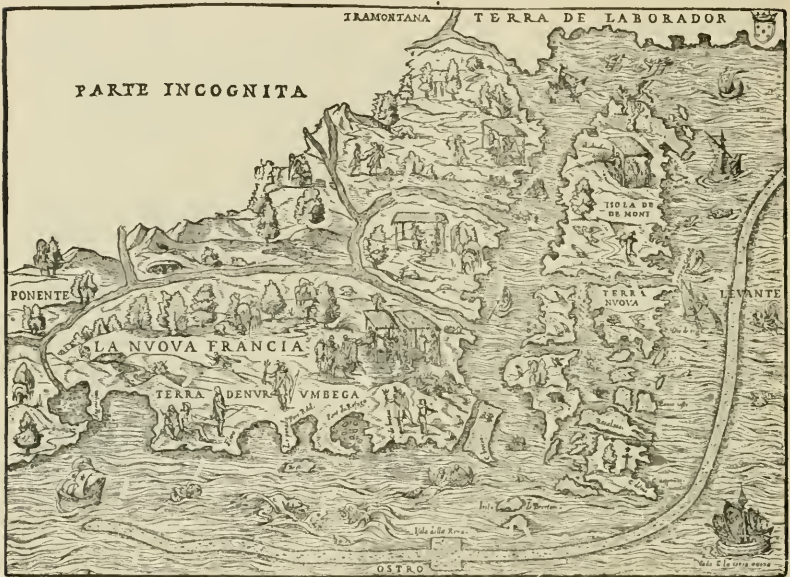
The picture given on the following page represents the people which Verazzano, the early navigator, found dwelling on the coast of New England. There is no stockade in sight, but the people were dwelling under booths, surrounded by wild animals. There are other pictures of the same region, which represent the stockade as numerous. In the picture we see the various habits of these natives and their costumes; we also see the kind of boats with which they navigated the sea. Verazzano is supposed to have sailed along the south side of Long Island and may have reached Cape Cod, and possibly Newfoundland and the islands, for Basque vessels may be seen in the picture. The picture is interesting because it is the first view gained of this section.

Another method of defense was by means of pyramids, which were terraced upon the sides and had a platform on the top. This was a plan adopted by the tribes in the Gulf States and all the civilized tribes of Mexico and Central America.

The pyramids at Cahokia marked the site opposite St. Louis of a large Indian village, but there was no fort and no wall around the village. The only defense was found in the pyramids, on which the people might gather and repel the attack of any invading foe.

There were similar pyramids scattered through the Gulf States, and it seems probable that they marked the sites of ancient villages. The pyramids combined a lookout station, with a safe dwelling place, and enabled the ruling classes to live separate from the common people. In this respect the villages resembled the villages of Central America.

It is to be noticed that terraced pyramids were about the only defenses that the civilized tribes possessed. At least very



VERAZZANO'S PICTURE OF THE NEW ENGLAND COAST.

few walled towns have been discovered, but nearly all the cities were marked by groups of pyramids on which the palaces were erected. The best illustration of the advantages secured by a terraced pyramid is found among the Pueblos of the far West. In Mexico and Central America the pyramids were constructed out of stone.

II. The most interesting method of defense was that which came from the combination of religious symbols and mechanical contrivances. This has not been fully appreciated, but the more one studies the prehistoric works, the more examples he will find. A good illustration of this may be seen at Fort Ancient, Ohio.

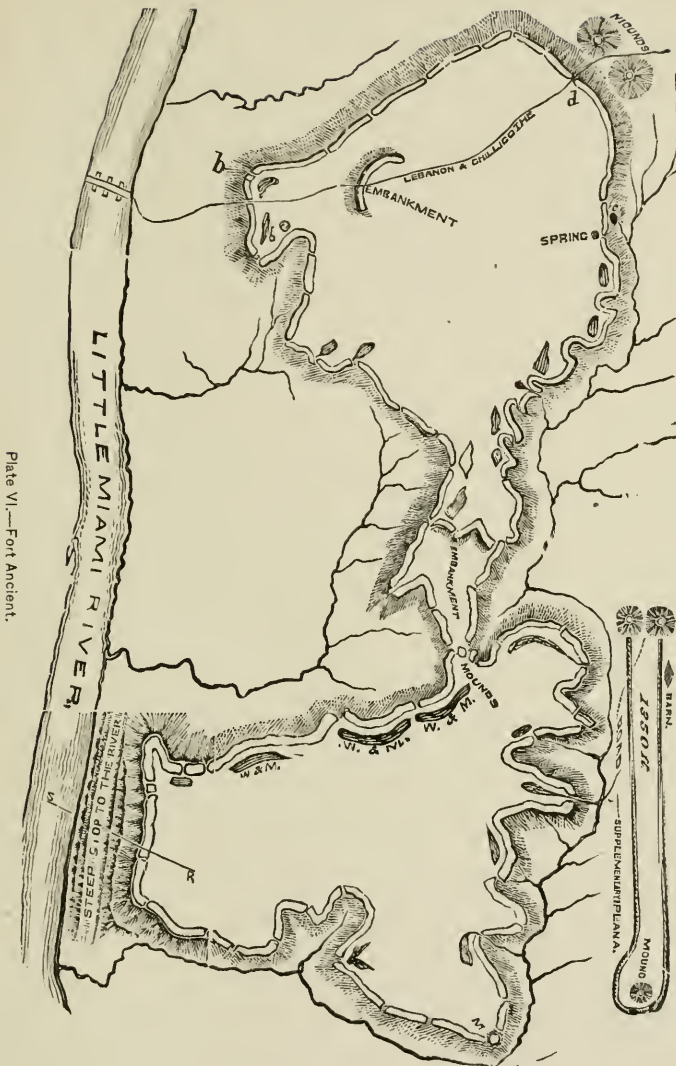


Plate VI.—Fort Ancient.

EXPLANATION OF THE CUT.—The unshaded lines represent the walls, the shaded lines the bluff, the dark lines the ditches inside of the walls. The parallel lines "supplementary" properly should extend from the mounds at *d* to the corner of the page, representing a north-east direction. The serpent symbol begins between "embankments and mounds," and extends around the lower enclosure.

(1.) In the first place, its situation is on the top of a promontory, defended by two ravines, which sweep around it to either side, forming precipitous banks, in some places 200 feet high. The ravines are occupied by small streams, with the Miami river close by, below the works on the west side. The wall of the fort is built on the very verge of the bluffs, overlooking the ravines meandering around the spot, and reëntering to pass the heads of the gullies, and is itself very circuitous.

The embankment in several places is carried down into ravines at an angle of 30 degrees, from fifty to one hundred feet in length, guarding the sides of the ravines and then crossing the streamlet at the bottom. The embankments may still be traced to within seven or eight feet of the stream.

(2.) On the verge of the bluff, overlooking the river, there are three parallel terraces. It has been suggested that these were designed as stations, from which to annoy an enemy passing in boats along the river.

(3.) At all the more accessible points, the defenses are of the greatest solidity and strength. The average height of the embankment is between nine and ten feet. In places, however, it is no less than twenty feet. At the spot where the State road ascends the hill and where the decline is most gentle, the embankment is fourteen feet high and sixty feet base. Near this point, at a place where a stream makes an opening in the wall is a crescent embankment which is so built as to protect the opening, and make a barrier against approach. The wall about the large enclosure is perfectly level on the top, and is from six to eight feet in width, the angles and sides being peculiarly well formed and clean cut, giving to the whole structure the appearance of great finish and of much skill. There are over seventy gateways or openings in the embankment, which were originally about eight or ten feet in width. The object of so many gateways is unknown, but it is supposed that they were once occupied by block houses or bastions, composed of timber which has long since decayed. There is no continuous ditch, but the earth had been dug from convenient pits, which are still quite deep and filled with water. These are on the inside of the wall. The wall is composed of tough clay, without stones, except in a few places, but is remarkably well preserved. The slope of the wall is from 35 to 45 degrees, but in the lower part of the Peninsula the wall conforms closely to the shape of the land.

(4.) There are two grand divisions to the fort, connected with one another by a long and narrow passage, the wall between the two enclosures being nearly parallel, but conform to the shape of the ground; across this narrow neck there is car-

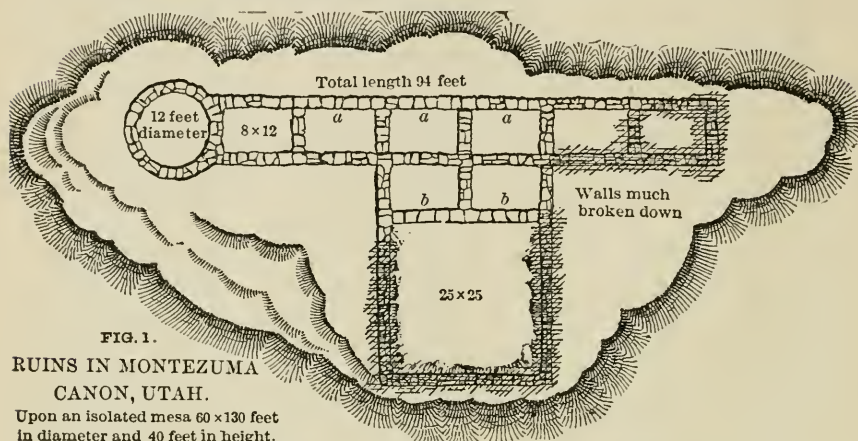
ried a wall, as if to prevent the further progress of an enemy if either of the principal enclosures were carried. Two large mounds are also built at the narrowest points, and between them was a paved way, as if some special arrangement for a gateway or entrance had once existed. The combination of the signal system with the fortified enclosure are manifest on all four sides, *i. e.*, on the northeast side, with the two mounds in the covered way; on the northwest side, in the walls themselves; in the southwest side, by terraces and by the walls which here command an extensive view; and in the southeast side, by a mound. This mound was erected at the extreme southeast point of the inclosure, as if for a lookout station on that side.

(5.) Abundant provision was made for the supply of water. The ditches, on the inside of the walls, would always contain more or less surface water. The springs in the enclosure would furnish a continual supply.

(6.) The author thinks that he has recognized in the shape of the wall, especially of the walls which surround the smaller inclosure, the form of a serpent. These walls are certainly serpentine in their course, and are so conformed to the roll of land, that their form gives rise to the conception. This may be merely accidental and not intended to embody the serpent symbol, but it is remarkable that the resemblance should have struck the eyes plainly at the very first visit to the place.

3. The Pueblos had the same system of defense which we have referred to, consisting of the combination of an enclosure with a lookout station. The combined system is here also connected with the village residences. This system helps us to understand many of the structures which were prominent among the cliff dwellers. There are watch-towers associated with the cliff dwellings which illustrate the point. These towers are generally situated on the summit of the cliff above the dwellings. They are described as having extensive outlooks, and yet they are so connected with the dwellings that communication could not be cut off. It has been supposed that these towers were estufas, and that they were used for religious purposes. If this were the case, then it is only another instance where the military and religious uses were combined in the same structure. The analogies between the Moundbuilders' works and the Cliff-dwellers, in this respect, are quite striking. To see this, we have only to compare the mound and circular inclosure at the end of the curved way at Fort Ancient with the circular tower above the cliff in the ruins in the Montezuma Canon (see the cut, fig. 1, on next page).

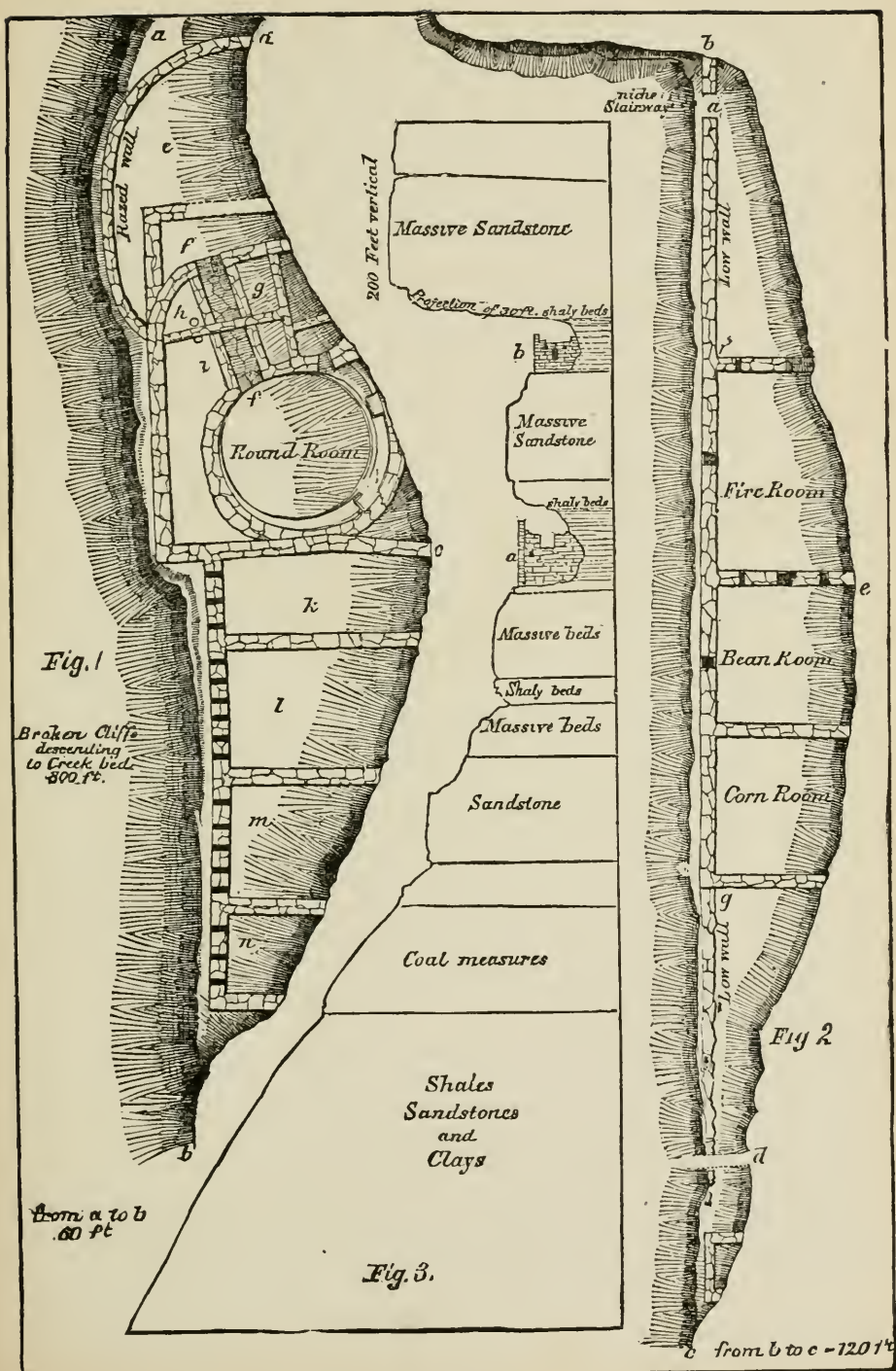
There are other towers among the cliff-dwellings which served as look-out stations or observatories. Two such towns have been described by W. H. Holmes.* These were situated on the Mesa above the cliff, a portion of the towers being left open on the cliff side. The towns were placed immediately above the caves which were excavated in the cliff-wall, and which were probably used as dwelling-places, while the towns served as fortresses, look-out stations, council cham-



bers and places of worship. Being on the borders of the Mesa, the strong outside walls were found necessary to protect against incursions from that direction. A square tower on the McElmo illustrates the same point. This building surmounts a rocky pedestal, and covers the whole surface of the rock. The windows open toward the north and east, directions from which the enemy, according to tradition, came. Another on Epsom creek, similarly situated, illustrates the same point. These towers are all close by the residences of the cliff-dwellers, and show that they not only depend upon the lofty isolation of their dwellings, which were perched 1,000 feet high on the side of the cliff, but also on the signal system, which would give them tidings of the approach of an enemy.

III. We come now to consider the most common method of defense known to the prehistoric race of America. This consisted in the combination of natural defense, with the works of architecture, the architecture being only supplementary to the defense of nature. It is a singular fact that the prehistoric races never attained to the modern method of defending ordi-

*See cut in AMERICAN ANTIQUARIAN, Vol. IV., No. 3.



nary places by military works, but they always chose strong points of nature and erected their military works upon them. There are, to be sure, many villages located in agricultural plains, which are protected by walls and enclosures; but the real defenses of the same people are generally found in the vicinity in the shape of strongholds, and the supposition is that the resort was to them in cases of extremity. The village inclosures have already been referred to, and their location with a view to agricultural advantages there spoken of. We are now treating of village defenses as such, and not village inclosures.

This method of taking advantage of the locality and adding to it an artificial defense was common with all the races. We see it among the Indians of the Atlantic coast, as their stockades were always on bluffs or islands, which were naturally impregnable. We see it also among the Moundbuilders, as their forts, so called, are always well located for defense. We see it also among the Pueblos and Cliff-dwellers, and even among the civilized races of Mexico. We would call attention here to the ancient Mexicans, for the idea is common, that they had attained to almost a modern skill in defense, and to modern methods of warfare. The history of the City of Mexico is remarkable, and illustrates this point; the history shows that the Aztecs were originally a weak tribe, but that they gained their superiority by the advantages of their location as a means of defense. They were crowded from the shores of the lake by neighboring tribes. They dug trenches and opened channels through the ground which they occupied, surrounding it by water, turning the channel of the streams which came into the lake, for this purpose; they made a long causeway, which connected the island with the mainland, leaving an occasional slough, covered by bridges, which were capable of quick removal; they divided their city into four quarters; erected their immense teocalli in the center, and then from this position they made their raids on the neighboring tribes. Their superiority consisted not in their valor, nor in their military organization, nor in their generalship, but in the invulnerable position of their capital. Montezuma did not prove to be a hero nor a warrior when the Spaniards came, and there is no evidence that he ever had great military skill. Human sacrifices and the custom of taking captives in war, made his people dread and fear him. There were many others more advanced in skill and culture than the Mexicans.

The defenses of the Mexicans outside of their city, were generally of the same character as those of other native races. They combined the advantage of natural location with artificial works. Even their far-famed towers, such as the pyramids of

Cholula, at Xochicalco, were of this character. They combined with the advantage of nature the additions of architecture and were used as places of defense. There were also the additional features to these pyramids, that they were regarded as places of worship, and were at the same time immense outlooks or observation.

The hill of flowers, or Xochicalco, is mentioned as a wonderful structure, and as giving evidence of the marvelous advance of the Mexicans in architecture and military skill. The idea is not common that these pyramids were designed for defense, but the combination of an outlook with an elevated, isolated position, gives to us a thought. It is possible that these were really fortifications, but fortifications built on the same plan as the Pueblo of New Mexico, the elevation of the pyramid giving the special advantage for defense. It is after all a somewhat cowardly method of defense, but one that corresponds with the character of the people. Retreat to the summit of the platform, like retreat to the cliff-dwellers, might secure safety for the time, but did not rid the country of an enemy. In the last extremity, a modern, civilized people would resort to it, but with the strange mode of warfare, prevalent among the native races, it was a common method. The sudden raids and fierce onsets, which resulted in immediate victory or entire defeat, would under this mode of defense, be almost a necessity. There was no organized or disciplined army, such as exists among other civilized races. There was really no military or strategic skill among them. Their fighting was like that of a mob. Vast numbers were massed together, but they crowded upon one another, and no military movements and no generalship existed among them.

Rapid mobilization was the peculiarity of the army, great forces without trains, or with trains carrying the simplest equipments were common. War was conducted by sudden forays or raids, but no regular campaigns. Deeds of valor on the battle field were common, but there was no skill in retreat. Rapid pursuit followed defeat. The vanquished fled to the Pueblo, and the question was, which would reach the Pueblo first.

In general, the conception of the tribes of Mexico in fortifying any particular place, amounted to raising it above the surrounding level and crowning the area with a parapet of stone or wood. As a principal means of protection they resorted to elevation. In some cases several tiers of parapets covered one side of the mountain declivity. The dwellings of the people rested on the highest terrace, but the huts of the warriors were erected on the outermost defenses.

There was also, in connection with this method of defense, the religious idea. The *teocalli* were both temples and towers of defense. "The great majority of the Indian towns of Mexico were open places without circumvallations or enclosures, and without any other strong holds than their massive communal dwelling and their pyramidal temples or *teocalli*.†" Added to these defensive means of their architecture, the recourses of a strong, natural position were sought for, and those tribes proved to be most powerful, which secured the strongest position.

We find the most singular illustration of this method of defense, however, among the Cliff-dwellers, and to these we would call especial attention. The Pueblos and the Cliff-dwellers owed their security to the same methods of defense. The positions which the villagers secured were of three kinds: (1) The cliffs. (2) High precipitous ridges. (3) The Mesas, which were somewhat isolated and surrounded by valleys. There were locations on the Mesas, where several villages could be grouped, and in these one Pueblo would aid another. The least defensible were those in the valleys or plains where there were no opportunities of outlook and no protection from nature.

It is a tradition that the Cliff-dwellers dwelt originally in villages like other Pueblos, but the incursions of fierce tribes like the Arapahoes and the Comanches, drove them from their original seats. They fled to the fastnesses of the cliffs, and there made homes for themselves, until driven out by starvation; as their enemy kept them in a continual siege, occupying the valleys below for entire seasons, and compelling the inhabitants of the cliff to flee over the mesas to distant places. This is rendered plausible by the resemblance of many of the cliff-dwellings to the Pueblos. The village system of architecture is manifest here, with the same features as among the terraced buildings elsewhere, with the exception of the terraces. The communistic system at least, prevailed here.

a. The arrangement of the rooms shows this. These are crowded close together into the shelter of the caves, and are divided by walls, the compartments being wherever it is possible, two storied, and the most of them without any opening for entrance except from the top, the wall being scaled by ladders, as in the case of the Pueblos (see Plate VII., figs. 1 & 2.)

b. The size and shape of the rooms (Fig 1—*k*, *l*, *m*), is another indication. The rooms in the Pueblos, are generally 9 x 20, and 9 feet high; those of the Cliff-dwellers are much smaller, some of them not over 6 x 8 in size. They are generally square, and erected with flat stone, the material being taken from the sides of the cliff.

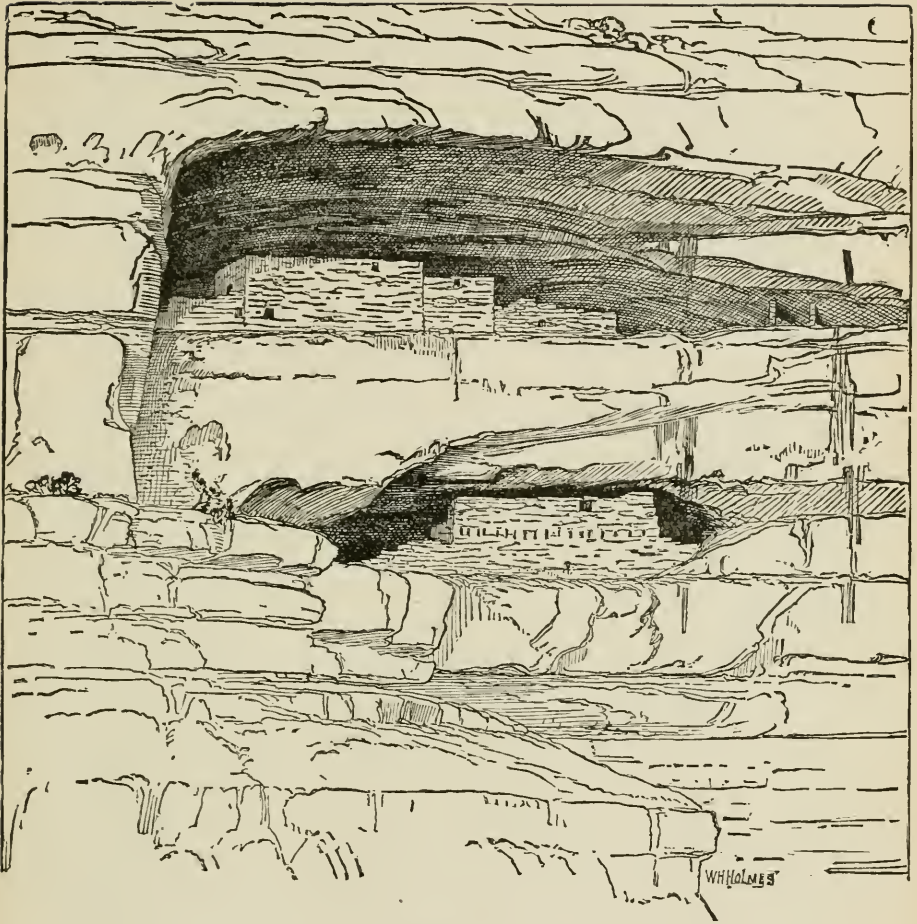
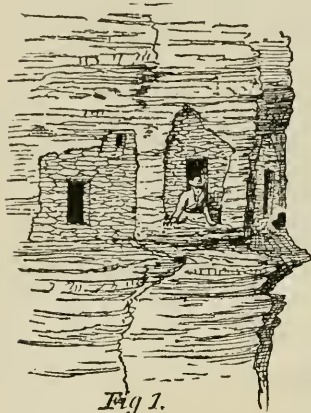


Plate VIII.

A front view of the Cliff-dwellers' village given in Plate VII. is shown in Plate VIII. It is described as situated 800 feet above the river, and so hidden away in the dark recesses, and so very like the surrounding cliffs in color that it was difficult to detect it. The lower house was accessible by the sloping cliff, but the upper store houses could only be reached by a passage up the cliff near one end at the point marked *a* in the ground plan. It shows how thoroughly protected these dwellings were.

c. There are many spaces among the cliff-dwellings which resemble the open court or Plaza, showing that the playground and the place of social resort was sought for by them, and, where it was possible, secured.



The houses were erected on the edges of the rock, with the open space within, between the houses and sides of the cliff. (Fig. 1, *c*, Plate VII.)

d. The presence of Estufas is another point. (Fig. 1, round room). The circular enclosures, found amid the square rooms of these high-perched villages show how essential the estufa was to village residence. If estufas could not be built on the level with the dwellings, they were placed just above on the edge of the cliff above, but closely connected with the village.

e. The store-houses (Fig. 2—also Fig. 3, *b*), found among the cliff-dwellings show that the communistic system prevailed here. Apartments in which have been found remains of corn and other products, are common. These apartments are, some of them, too small for residence, but would answer for store-houses, corresponding to the lower rooms in the Pueblos. The defense of these villages was in the situation. Mr. W. H. Jackson, who first discovered them and furnished an account of them, describes them as perched so high and hidden away so securely, as to be almost invisible to the naked eye, requiring strong telescopes to make out their outlines. Some of them were, at least, 1,000 feet above the valley, and were reached by the most difficult climbing of the precipitous sides of the cliff. Steps were hewn in the sides of the rock in places, but in other places, the dwellings could only be approached by ladders. Isolated dwellings are found among the cliffs, but generally the village was as compact as that of the Pueblos. The defense was in the height of the cliff and in the strength of the wall erected on the edge. We give cuts to represent the peculiarities of the cliff-dwellings. The size and shape of the apartments may be seen from the cuts.

A method of walling up cave fronts is described by W. H. Holmes. Cuts of two of them are given here, as they illustrate better than any description (fig. 1 and fig. 5). The three doorways open into as many small apartments, and these are connected by small passage ways (see fig. 1).

Fig. 5 also illustrates the same point, and shows how the villages were provided with the estufa when there was not a possibility of having the two on the same level. The cut illustrates how the estufas were protected by the walls even in those places where no more than one apartment was erected in the same niche. Figure 1, Plate VII., illustrates the combination of the estufa with the dwelling apartments and store-houses and play grounds, or places of assembly. A wall and covered passageway, *ff*, of solid masonry leads from the outer chamber to the estufa. This passageway is but twenty-two inches high and thirty wide, by twenty feet long, and was calculated to prevent intrusion from the profane, as any one who entered it must crawl in the most abject manner possible to the rooms in the upper shelter. Fig. 2, shows how the storing of provisions was also connected with the apartments for dwelling. In this case the store-rooms are above instead of below the dwelling apartments. The cliff projects fifteen or twenty feet beyond the house, protecting both the upper and lower apartments. A stairway of small niches cut in the rock connected the two. The sloping bluff gave access to the water below. The position of the ruin is one of incomparable security both from enemies and the elements.

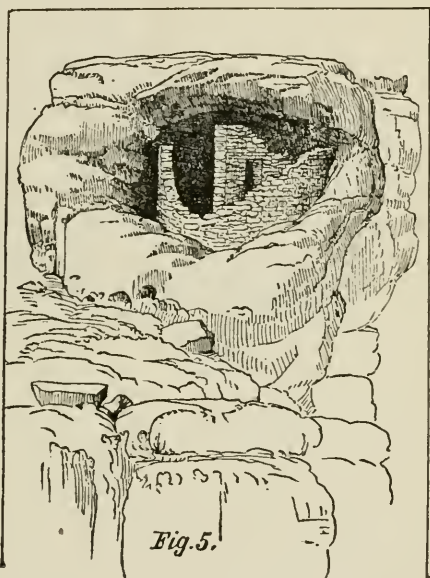


Fig. 5.

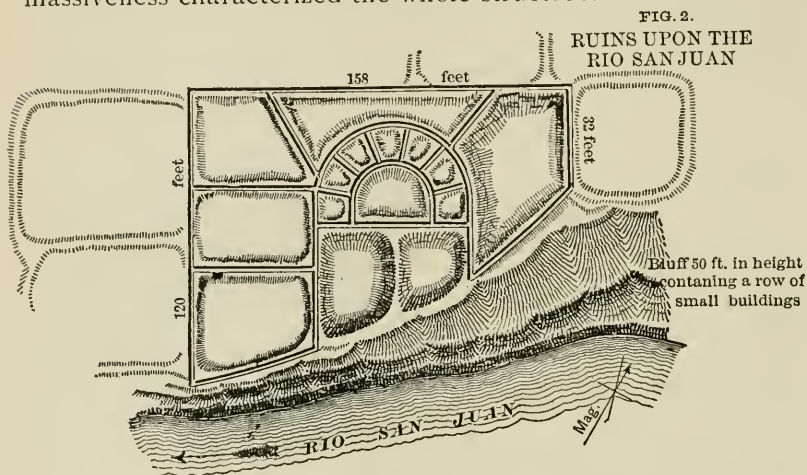
A similar village, but on a small scale, is seen in the Ruin upon the San Juan river. The ground plan in the figure shows the analogy between the Cliff-dwellers' village and the Pueblos (see cut). The site of this village can hardly have been chosen for its defensive advantages, as it is situated below the cliffs on the bank of the river. It would probably come under the head of an agricultural village rather than a Cliff-dwellers' defense, but is referred to, to show the analogy.

The description of this ruin is given by W. H. Jackson.*

"Upon the top of a bench about fifty feet above the river, but underneath the bluff, are the ruins of a quadrangular

*See Report in United States Geological Survey of the Territories, F. V. Hayden in charge, for 1875.

structure of peculiar design. It is arranged at right angles to the river. In the center of the building, looking out upon the river, is an open space 75 feet wide and 40 feet in depth. We judged it to have been an open court, because there was not the vestige of a wall in front. Back of this court is a series of seven apartments, arranged around a semi-circular space which is 45 feet across its greatest diameter, each one being 15 feet in length and the same in width. On the sides of these were other apartments averaging 40 and 45 feet square. Extreme massiveness characterized the whole structure."



The cliff-dwellings are not the only ones which have their position in strong points for defense. The Pueblos of New Mexico are also noted for this. Dr. Oscar Loew has described the ruins of two Pueblos, in the province of Jemez. They are situated upon a narrow ridge or mesa, which is nearly 750 feet high, and nearly perpendicular. Upon this ridge, near frightful precipices, are the ruins of eighty houses, partly in parallel rows, partly in squares, and partly perched between the over-hanging rocks, the rims and surfaces of which formed the walls of the rooms. Nearly every house had one story and two rooms. The village was only approachable by two narrow, steep trails. The view from the mesa is picturesque and imposing in the extreme.

In the province of Aztlan, are ruins of former fortified towns. Some of the fortified structures had as many as 500 rooms in them. Prof. E. D. Cope has called attention to a village of thirty houses, extending along the narrow crest of a hog-back or ridge, in Northwestern New Mexico. One town he calls Cristine. He says that they were doubtless perched on these high eminences for defense, but they were conveniently

located near a perennial stream, which enabled them to carry on a system of agriculture. He says also that the number of buildings in a square mile of the region is equal to, if not greater, than the number now existing in the most densely populated rural districts of Pennsylvania or New Jersey. The inhabitants of the rock houses necessarily abandoned the communal type of building, and considered only the capacity of their buildings for defense. Mr. Cope also mentions other buildings erected on the summits of knots of land, or circular conic hills. These are only fifteen to twenty feet in diameter, were probably either a lookout station or towers connected with other buildings which are in ruins. Dr. Yarrow has described the ruins of an ancient village, in the valley of the Rio Chaca, and mentions six or eight other towns in the vicinity which, together, would contain a population of two or three thousand. The mesa is 250 feet above the level. The front of it is a sheer precipice, allowing no ingress to the town, capable of being defended against thousands, by a dozen resolute men, with no better weapons than rocks and stones.

3d. The seven cities of Cibola have been described by many. Col. Simpson, who was the first person who visited the region and discovered the remarkable ruins of the buildings of the Pueblos, considers that these cities were identical with the Pueblo of the Zunis. This has been disputed, but the descriptions help us to understand the nature of the defenses. The number, seven, has been used to prove the identity, but there are several localities where seven villages may be found in close proximity. Dr. Loew says that the seven villages belong to Tehue, the same number existed among the Moquis. There is no doubt that the Spaniards, in their march under Coronado, in 1541, found many fortified towns. In fact, the villages in all the canons of this section, the San Juan, Las Animas Jemez, Canon Chaco, Rio Mancos, and others, have fortified Pueblos, and give evidence of having been densely populated. The description given by the historians of that early date is valuable, because it will apply to nearly all the Pueblos of the region. It may be interesting to identify the exact spot, but the villages are very similar in their characteristics, the main difference being in their adaptation to the particular spot in which they are located. The defense is mainly in the situation.

IV. We take up briefly before we close this paper one other method of defending their villages used by the prehistoric inhabitants, namely, that offered by the religious system prevalent. This part of our subject requires a separate chapter, but we shall refer to it here, especially as it is so closely

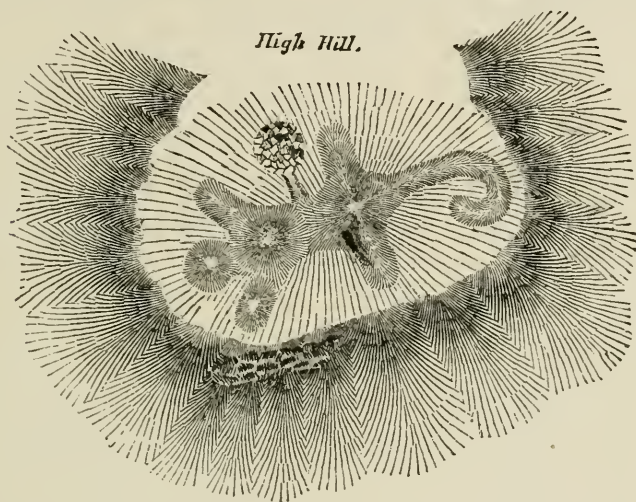
connected with the defensive structures, and cannot be understood except as it is associated both with village residences and village defense.

The combination of the religious with the military system has not been sufficiently studied to be understood, but the specimens given are worthy of consideration. It seems to have prevailed among the Moundbuilders more than any where else. It also existed among the Pueblos or the Mexicans. The History of the Conquest of Mexico reveal the fact that the religious element was there mingled with the defense of the people. The resort of the people was to the temples, and the great Sun-God was appealed to for protection. It was with great amazement that the people saw the idols of their divinities thrust down from their height, and when the idea at last seized upon them, that both the power of their rulers and the protection of their gods had been withdrawn, the result was that despair spread throughout the nation, and their destruction became complete.

(1) This point is also worthy of special notice in connection with observatories. There are a few very remarkable works throughout Ohio, which bear the character of effigy mounds. We refer to the Alligator mound at Newark, and the great Serpent in Adams county. It appears that the Alligator mound in Newark overlooked the extensive system of village enclosures, and that its position also made it a prominent object for the whole region about. There are signs also of an altar near the Alligator, where fire was evidently kept alive. The same thing has been noticed by the author in connection with effigy mounds. One such case may be seen on the east side of Lake Wingra, near Madison, Wis. All of these sacrificial places are on high points, and seem to partake of the nature of observatories as well as sacrificial altars.

We give a cut of the Alligator Mound to illustrate this point. The mound is situated on a hill which overlooks the whole valley where the ancient village at Newark is situated. There are signal mounds on all the hills surrounding the valley, and the extensive works are situated in the valley below. The impression given by a visit to this lofty spot where the effigy is seen is, that here the great Divinity of the people resided, and here the beacon fires were lighted which would illuminate the whole horizon. On this spot the sacrifices would be offered. But the idea of defense may prove as prominent as that of worship, for the monster certainly overlooked the whole scene, and it is more than probable that it was regarded as the great Guardian Divinity of the place.

These sacrificial mounds may not have been observatories, in a strict sense of the word, for they seem to have had a religious object rather than a military. We refer to them here, however, for they give evidence that the religious element was mingled with the idea of defense. This we believe to have been one object, for the location of the sacrificial mounds, and especially the shape of the animal effigy, would indicate that a divinity was thus embodied, and that the idea was prevalent among the people that the guardian spirit was in the effigy and haunted the locality. The Animism which prevailed



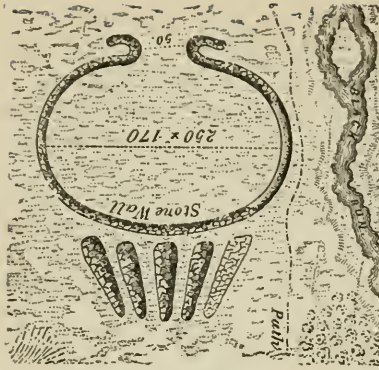
among the people would lead them to associate the two ideas, the Tutelar divinity being both an object of worship and a protecting power, the sacrifice appeasing it, and the effigy symbolizing it. These effigies were isolated as if the divinity dwelt in lonely grandeur, and yet the outlook over all the region, and especially over the villages which were located beneath them, indicates that the feeling of protection was strong with the natives, their view of the height on which was erected the symbol of their divinity being a constant reminder of the protective presence.*

(2) The point is also worthy of attention in connection with the enclosures. We have referred to the serpent symbol supposed by us to be embodied in the walls of Fort Ancient. This has been doubted.

Other forts, however, have similar walls surrounding them. One such is depicted by Squier and Davis.† A fortification is situated on the Great Miami, four miles from Hamilton, in

*See ANTIQUARIAN, Vol. IV., No. 4.

†See plate II., figures 1 and 2, on page 217 of AMERICAN ANTIQUARIAN, Vol. IV., No. 3.



Butler county. The walls curve inwardly, at the gateway on the land side, forming a semi-circle or a horse-shoe, with a diameter of 150 feet. Between these walls, at the entrance of the gate, is a circle of 100 feet in diameter, which nearly fills the space, leaving the passage for the entrance way only about six feet wide. On the outside of the circle, and guarding the entrance to the passages is a mound, forty feet in diameter

and four feet high. The form of the serpent is seen in the shape of the wall at the gateway, and in the curve of the walls along the bluff, as they surround the enclosure. A similar resemblance to the serpent form may be seen also in the stone wall which has been described by Squier and Davis, at Black-run, fifteen miles from Chillicothe, in Ross county, Ohio. The gateway or entrance to this stone fort also has the serpentine form, as the ends of the walls bend around and back upon themselves in a way which suggests that the serpent symbol was intended. The gateway was fifty feet wide, but the walls curved back for the space of sixty feet. There are four peculiar stone heaps on the outside, starting within ten feet of and extending northward for the distance of 100 feet. These walls are twenty feet broad at the ends, but they diminish gradually as they recede to ten feet, at their outward extremities. They are ten feet apart, but being tapering they converge, and, taken together with the enclosure, they give rise to the idea that they were intended to represent the rattles of a huge serpent. No other explanation can be given to the shape of the walls, nor to the outlooks though the resemblance to the serpent form has never impressed any one before.

Dr. Phené says that there are four and not five of these unique and strange stone walls or stone heaps. His idea is that they represent double rattles, a point which he has recognized in other works.

The great stone fort on Paint Creek is but two miles away and overlooks this work. Both may be regarded as belonging to the same system, and probably in some way connected with each other. The situation of this enclosure may be seen from the map of the works of Paint Creek. It will be noticed that this serpent inclosure has somewhat the same relation to the village inclosures of the valley that the Alligator Mound had to the inclosures at Newark.

Allied to this custom of using serpent figures in connection with the forts and villages, is the custom which prevails on the Northwest coast. Here the tribes are all related to one another and are generally at peace; and yet each village is independent of every other village, and is controlled by some chief, who rules in the name of some great supernatural divinity; the emblem of this divinity is placed in front of the houses, or carried upon the poles, and is sometimes painted upon the canoes. This fact has been a source of protection to the villages for generations.

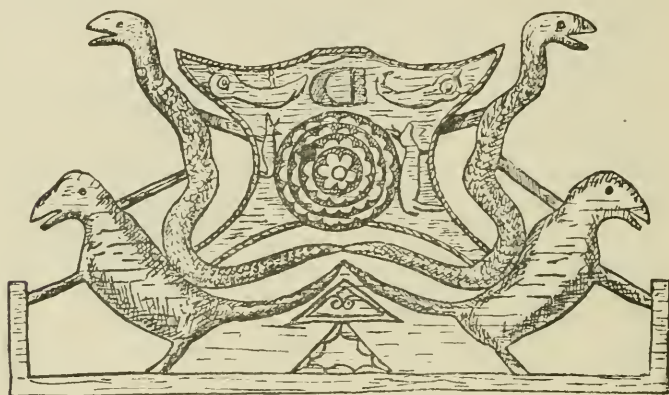
The figure of some animal or bird or fabulous creature is either placed upon the front of the houses or carved on the totem poles, and is seen and feared by all those who approach the village. It serves the same purpose as did the Great Ser-



ORNAMENT OVER A THLINKEET DOOR.

pent Mound in Ohio, and as did the great serpent effigies, made of stone, which formed the balustrades of the stairway at Chichen-Itza, and as do the dragon figures which are still seen placed over the pagodas and temples of China. In fact, we may compare all these figures to the celebrated lions which were placed over the gateways at Mycenæ, and the immense human-headed bulls which were placed in the palaces at Ninevah and Babylon, and the sphinxes which guarded the approach to the pyramids of Egypt. There are also peculiar figures to be seen carved upon posts in front of the houses in Polynesia, and upon the rocks near the stone houses of the Easter Islands. These may be supposed to have served the same purpose as the carved and sculptured figures referred to above. They were not fortifications, for they did not present any physical or material barrier, but there was back of these figures a religious influence which served as a protection to the houses.

On the Northwest coast there were many other devices which served to impress the people with a sense of fear. The figures which were carved upon the totem poles were often so fierce and ghoulish in their attitudes and combinations that they are calculated to frighten anyone who looked upon them; but the people here were accustomed to make masks which were even more frightful, and to wear these in their dances and religious ceremonies. These made known the divinity or manitou which was supposed to preside over the village, and served as a protection to all who dwelt in the village. There was a vast system of mythology which prevailed among the people which increased their superstition. Among the myths the most remarkable were those which told of the dangerous exploits of certain birds and animals which were supposed to haunt the air and the sea and the land. The most interesting one of these is called Ho Xhok. This fabulous bird has



COAT OF ARMS IN SUMATRA.

an immensely long beak and lives on the brains of men. Another one is called "Hamatsa," a cannibal, who instills into others the desire of eating human flesh, and devours whomsoever he can lay his hands upon. Another monster is a cannibal living on the mountains and is always in pursuit of man. Red smoke arises from his house. He has a female slave who procures food for him by catching men and gathering corpses; near the door of his house sits his slave, the Raven, who eats the eyes of the people whom his master has devoured. These fabulous creatures are often represented carved in wood and placed over the graves or in front of the houses, and form prominent objects in the villages. The double-headed serpent also is used as a totem, as well as a symbol of office and of power. It owes its power to a superstition which existed among the people.

These superstitions prevailed so extensively through the entire region, that they had the effect to keep the people who

are scattered about, at peace with one another. The dances are religious ceremonies, and in them the masks are worn which represent deer and eagles and birds and human faces and wild animals in the most grotesque and hideous manner.



TOWERS IN PERU.

The masks are often-times double, so that faces which represent birds will open and other faces are to be seen that are hideous, the glaring eyes and open mouth and serried teeth of these hidden faces being calculated to inspire all who look at them with fear,

Another device is sometimes seen painted on the front of houses, which reminds us of one which was used as a coat of arms on the coast of Sumatra on the opposite side of the Pacific ocean. It consists of a double headed serpent, whose body rests over the door. Above the serpent are two birds resembling eagles; below are two

other birds resembling ravens. Above, over the door, are two human faces and a bird standing upon them. The coat of arms, as described by Mr. Henry O. Forbes, "consists of a shield with double supporters on each side; a tiger, rampant, bearing on its back a snake, defiant, upholding a shield in whose center the most prominent figure is a sunflower, with two deer, one on each side; above the ornament is a half moon; the figures below the shield are two triangles, balanced on top of one another."*

This emblazoned board and its carved surroundings was hid away in a little lone hamlet, among a half savage and pagan people. It was a surprise to the one who discovered it, but it is more surprising that it should so much resemble the figures painted over the doorways of the native tribes on the Northwest coast.

Whether these resemblances were the result of contact, or parallel development, is a question, but this at least is true:



STAIRCASE IN PERU.

* See "Naturalist's Wanderings," by Henry O. Forbes. New York: Harper Bros.; 1885. Page 180.

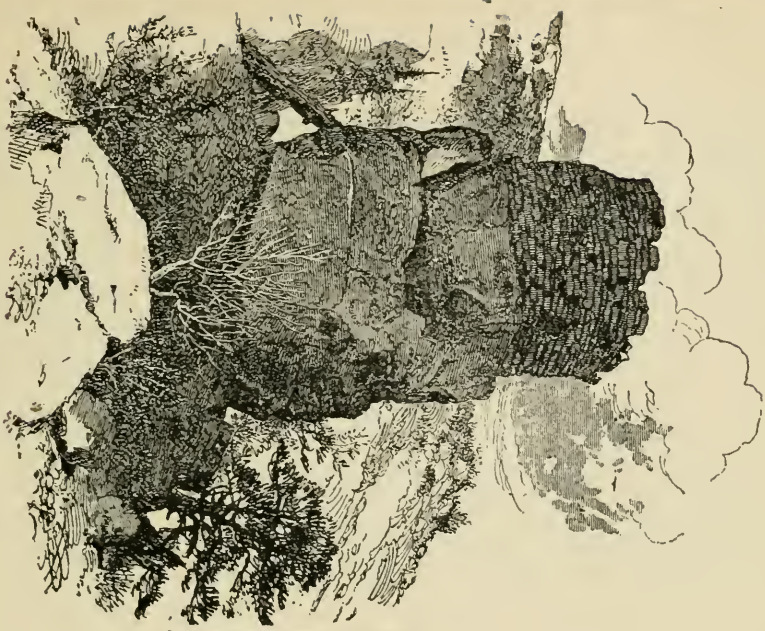
the serpent and the tiger served as an emblem on the coast of Asia, as did the serpent, the raven, the eagle, and other creatures on the coast of America.

Another example of this method of defense was found in the massive serpents which formed the balustrade to the stairway at Chichen-Itza. Here the monstrous head projects out eight feet beyond the foot of the stairway, and its open jaws and glaring eyes are so hideous as to impress anyone, and to the superstitious must have been exceedingly terrifying. These figures were perhaps designed more for ornaments than for defense, but they may have served the same purpose as did the Lion Gateway at Mycenæ, and the ghoulish looking idol which was placed over the gateway to the temple at the City of Mexico, both of which had the effect to keep the sacred places from the intrusion of profane feet.

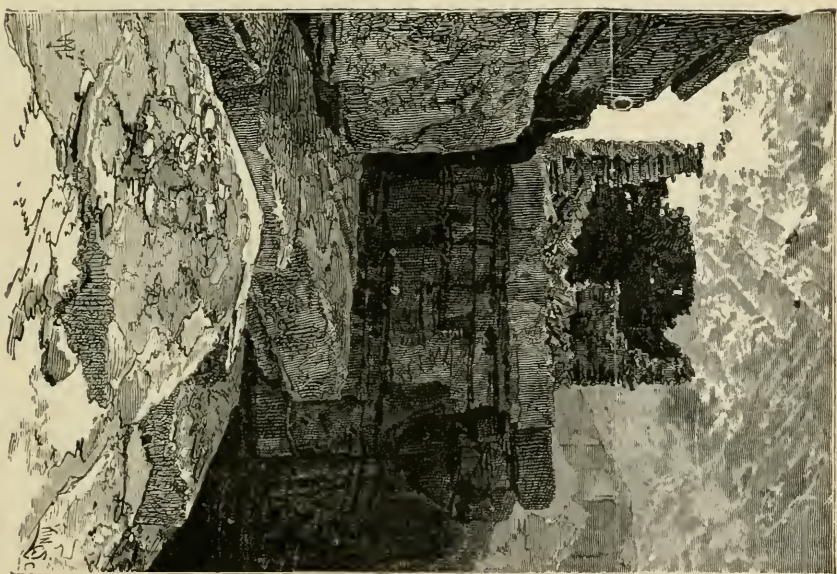
V. There remains to be considered another method of defence and one that was more effective than any other. It consisted in surrounding a city, and in some cases an entire country, with a strong, high wall, and then placing at the gateways and the passes high towers, which were guarded by troops, and protected the city and the country from invasion. In many cases there were narrow stairways which led up to the citadels, and these were guarded by troops. The cuts represent these defenses, which were common in Peru. One of them represents the stairway at Pisac, the other the fortified pass at Pisac.

Mr. E. G. Squier says of these: "Wherever it was possible for a bold climber to clamber up, there the Incas built up lofty walls of stone, so as to leave neither foothold nor stone for an assailant. In one case the ascent on the side of the town is by a stairway, partly cut in the rock and partly composed of large stones, which winds along the face of the rocky escarpment; hangs over dizzy precipices; twines around bastions of rock, on every one of which are towers for soldiers, with their magazines of stones ready to be hurled down on an advancing assailant. We find every projection or escarpment of rock crowned with towers, generally round, with openings for looking out through which weapons might be discharged and stones hurled. Every avenue of ascent is closed. Every commanding and strategic point is fortified. Every peak is protected by a maize of works which almost baffle description."

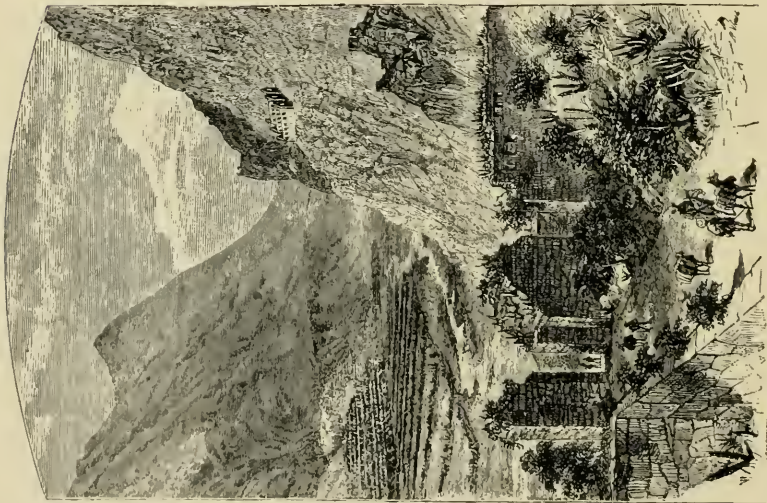
These towers, stairways and mountain passes resemble those which still exist in the midst of the gold regions of Mashonaland, which are very mysterious, because no one knows at what time or by what nation they were erected.



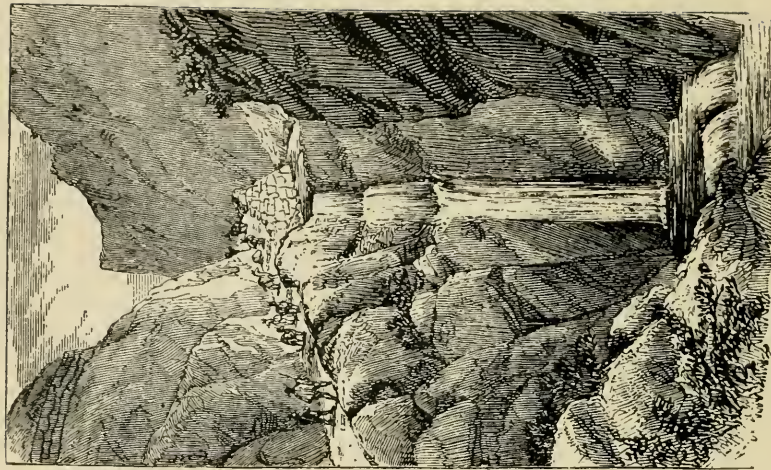
THE BLACK TOWER ON THE MANCOS RIVER.



RUINED TOWER ON THE COLORADO RIVER.



GATEWAY CASTLES AT OLLANTAYTAMBO, PERU.



FORTIFIED PASS AT RODADERO, PERU.

CHAPTER XII.

HOUSES AND HOUSE-LIFE.

HOUSES OF FISHERMEN; OF HUNTERS; OF AGRICULTURAL RACES;
OF THE PUEBLOS AND CLIFF-DWELLERS.

The subject of house-life is an interesting one, whether it is found in the historic or prehistoric races; for it brings before us a picture which is not only familiar but real. Nothing is more suggestive of the life of the people, and nothing better reveals the actual state of the times than this. If we can get an inside view of the homes of any people we may conclude that we have a good knowledge of what kind of people they are. 1. House-life not only brings before us the condition of society, but makes known whether society was divided into families, into clans, or into any other groups. It other words, it reveals what was the real unit of society. 2. House-life brings before us more or less of the history of the people. If we take the ground that there has been a progress from the lower stages to the higher with all people then we only need to look at the condition of the house and home to know through what stages the people have already passed. 3. House-life also throws light upon the question of race and religion. It is not always the case to be sure that we can determine to what race a people belongs by looking at its homes, and yet there is much in the style of the buildings and in the internal arrangements which suggests the nationality, or race, to which the occupants belong. If this is the case in civilized countries, it is much more so in the uncivilized countries. 4. The religion of the people is also made known by the home. In idolatrous countries it is easy to tell the religion of the people by the idols which are common. In countries where idolatry does not prevail the signs are not so apparent, and yet there will be many things in the house which, to the observing eye, will reveal the faith of the household. This is as true of the prehistoric as of the historic races. 5. House-life furnishes an index by which we can learn the degree of civilization which prevails. By this we can learn the condition of art and of letters and ascertain the real status of the people, as regards civilization and social progress. The condition of woman and the character of the children will be seen in the home more than anywhere else, and even the disposition of the men and their modes of life will be unconsciously brought out by the house or some of its surroundings.

The question arises, however, if house-life is so suggestive, how can we ascertain what it was during prehistoric times? Our answer to this question is that the chief means is by studying architecture, and especially that form of architecture which was embodied in houses. The American continent furnishes a most favorable field for this line of study. There are here so many different specimens of house architecture, and these specimens are so distributed in the different geographical districts and so correlated to the occupations, social conditions, modes of life and means of subsistence, and other peculiarities of the people, that we have only to look at these structures to ascertain much concerning the prehistoric times. The study of the monuments brings us to this conclusion.

If one can ascertain the character of a people by looking into their homes, and may always find that the house presents a true picture of what the people are, then the importance of the knowledge of the house architecture of the prehistoric races will be understood. We therefore address ourselves to the subject. We are to study the houses and the house interiors of the American races, with a view of ascertaining from them what were the habits and ways of prehistoric peoples. Our effort will be, first, to ascertain whether the employments and modes of life are indicated or represented by this class of structures; second, to learn whether the stages of progress are indicated by the house-life; third, to examine into the social organization and to see whether the house is in any way an exponent of the clan system.

In reference to the first point, that is the employment, it will probably be acknowledged that in a general way the house and house-life are so correlated to it that we may ascertain the one from the other. We may need, to be sure, to examine the surroundings, look, not only to the debris of the camps and at the weapons and implements which may be associated with the place, but also the locality and all the surroundings to ascertain the employment; and yet we may regard the house as the best representative, a better exponent than all. In reference to the second point, the grade of society or stage of progress, it is not always true that the house is a clear index, and yet, if we take the house in its geographical location and with those things which may be regarded as its contents, and consider that all are correlated, we shall be able to ascertain the exact condition of the people. In reference to the third point the task will be more difficult. It is an unsolved problem whether the primitive races lived in the communistic style and whether the clan system was universal. The size of the house and the internal arrangements have generally been regarded as indices of these, and yet it requires a very close analysis and careful study to ascertain the real facts. We shall take the house as the basis of inform-

ation and seek to ascertain from this what was the real condition of the people. We have already shown that primitive society was divided into different grades, the grades varying according to their employment. The fishermen represent the lowest grade; the hunters that which is next higher; agriculturists that which is still higher; villagers the next higher grade, and the dwellers in cities the highest of all. This may seem like an arbitrary division and yet it is carried out by the facts in the case. In America we find occupations so correlated, and the grades of society so marked by the houses that there is no difficulty in distinguishing them. They are, to be sure, divided by geographical lines and are so arranged in the different belts of latitude that we can almost tell before hand what to expect. The fishermen as a general thing are in the colder regions; the hunters in the regions farther south; agriculturists still farther south; and the civilized races in the torrid regions; so that all that we have to do is to consider the geographical locality and we may at once know what the grade of society was and the employment, the means of subsistence and the general condition of the people, and the problem seems to be an easy one, yet in reference to the communistic system and some other points we find ourselves frequently baffled. We are to bear these points in mind especially, as we consider the houses which are found in the different parts of the continent. If we find what the typical structure was for each of the employments, and what kind of a house was associated with each grade, we are still to ask about the clan system, the communistic state, the social organization, the marriage rites, and those other questions which come up in connection with the home or house-life.

I. We begin then with the houses of fishermen, especially those which are found in the frozen regions of the north. 1. We are to consider these as the typical structures, for a certain grade of society during the prehistoric age. We maintain that we have in the hut of the Eskimo a type not only of the rudest and most primitive, but the earliest form of house. We now find these huts on the border between the ice-fields and the water-plain marking a sort of bank between the habitable and the uninhabitable; but in prehistoric times the line was much farther south and we may imagine that this kind of hut then was built on the edge of that great glacial moraine whose folds stretch from the Atlantic to the Pacific in the latitude of 37° and from that to 45° . This is our first epoch of house-building. Another point is noticeable. The house of the northern fishermen is the structure which intervenes between the cave-dwelling and the later habitation. As in Europe the dolmen and cromlech and lake dwellings are supposed to mark the line between the cave and the architectural structures, so these fishermen's huts mark the line in America. We here call attention to the remarks

which Mr. William A. Dall has made about the houses and huts of Alaska. He has described the different stages of progress which may have taken place before the beginning of house-building. These stages he ascertained by the study of the relics and remains which he discovered at different depths in the shell-heaps. He thinks that the means of subsistence, the mode of life, the style of habitation were correlated. He divides the epoch of human occupation into three or four different periods. First is what he calls the littoral period,* a period in which men built no huts and did not even occupy caves, but were mere squatters, so to speak. They were so rude that they merely covered themselves with a temporary structure of drift-wood and straw, something as the inhabitants of California shield themselves by huts of brush-work. This hardly seems possible, for in such a climate as Alaska no human being could have lived without protection. Mr. Dall found caves in this region, though he thinks the caves were only temporary habitations of hunters, and not of the fishermen. It is probable that we shall not find out what was the habitation of man during this period and yet it would seem as if caves were the habitations then as well as during the fishing period. Mr. Dall says that the stratum in the shell-heaps which marked the fishing period differed from the preceding by the appearance of a few rude net sinkers, chipped stone knives, bone darts, and hand lances, and by quantities of fish-bones and says the fishing period was represented by the fish-bone layer, but that the littoral period was marked by the layer of echinus shell. He says "the total absence of awls, bodkins, knives, needles, buttons, or of any bone utensil which might be used in making clothes leads to the conclusion that the people did not wear clothing." He says "there were no lamps, no baking stones, no hearths," so he concludes that this ancient people were not in the habit of using fire. According to this the ancient man in America must have been a very strange kind of creature. It seems much more satisfactory to take the cave-dweller of Europe as the representative of the littoral period and the hut-builder as the representative of the fishing period. We strike upon these solid facts when we reach the fishing period. This period is marked by the use of fire, by the manufacturing of clothing, and by the erection of rude huts or houses. Here then we have the order of succession. In Europe we have gravel beds the first, cave-dwellings the second, lake-dwellings the third, stone monuments the fourth, but in America the littoral period, the fishing period, the hunting period, the agricultural period. We put the beginning of house-

*Mr. Morgan makes natural subsistence upon fruits and roots an evidence of the earliest stage, but assigns the inhabitants to a tropical or subtropical climate. Fish subsistence was correlated to the middle stage of savagery. Outside of the great fish areas cannibalism became the dire resort of mankind. The littoral period we consider arbitrary, yet suggestive.

building in the second or fishing period, and assign the cave-dwelling to the so-called littoral period. The Eskimo's hut is perhaps a good representative of the first constructed house.

This type of house is found among fishermen in all parts of the continent, though it may not always be constructed of ice-blocks or attended with the same underground entrance, yet as a style it is common. It is very remarkable that the dolmens and cromlechs of Europe have retained some of the features of this earliest kind of house. They have the long entrance to the inner chamber and were generally covered with the hemispherical mound resembling the Eskimo hut.

It is supposed that the graves of Europe were frequently imitative of the houses, the urn huts being imitative of the lake dwellings, and the dolmens imitative of the fisherman's house. This same prevalence of early types of houses may be seen in America. It is very remarkable at least that the huts or houses of the tribes which occupied the shores of the great lakes were generally hemispherical,* as were the houses of the Eskimo. They were to be sure covered with bark, which was laid upon a framework of poles, and not of ice-blocks; but we connect the shape with the employment. It is also well known that in America the hunter tribes generally constructed houses made from a frame-work of poles, which were covered either with bark or matting or skins; but it is remarkable that the hunter's tent or wigwam was almost always in the shape of a cone, the poles being tied together at the top very much as a number of muskets would be stacked, and the covering placed upon the poles. We here give the cut illustrative of these two styles of dwellings. See Fig. 1. The one is the hut of the Chippewa tribe, the other of the Algonquins. In the cut may be seen the earliest form of structures erected by the white man, the old-fashioned wind-mill; and the difference between the native inhabitants and that which was introduced from Europe, especially France, may be recognized.

2. It would seem that we have the typical structures of the first stage of society, and that the earliest people who undertook to build houses at all must have dwelt in huts like these. This thought is confirmed by the investigations into the kitchen middens or shell-heaps. Mr. Paul Schumacher has described the kitchen middens on the coast of Oregon, and speaks of the sunken rings or depressions in the shell-heaps as if they were an indication of the kind of houses that were occupied by the fishermen. He imagines that they were conical or hemispheri-

*Mr. Morgan says: "At the time of their discovery—1641—the Ojibwas were seated at the rapids on the outlet of Lake Superior. Their position possessed advantages for a fish and game subsistence, which, as they did not cultivate maize and plants, was their main reliance. The Ojibwas and Ottawas and Pottowottomies are divisions of the original tribe. Their home was originally upon the shores of Lake Superior. All of these tribes have the same kind of tent."

cal houses covered with earth. The age of these kitchen middens is unknown, but it does not matter. In Denmark and Sweden the kitchen middens are supposed to be of an ancient date,

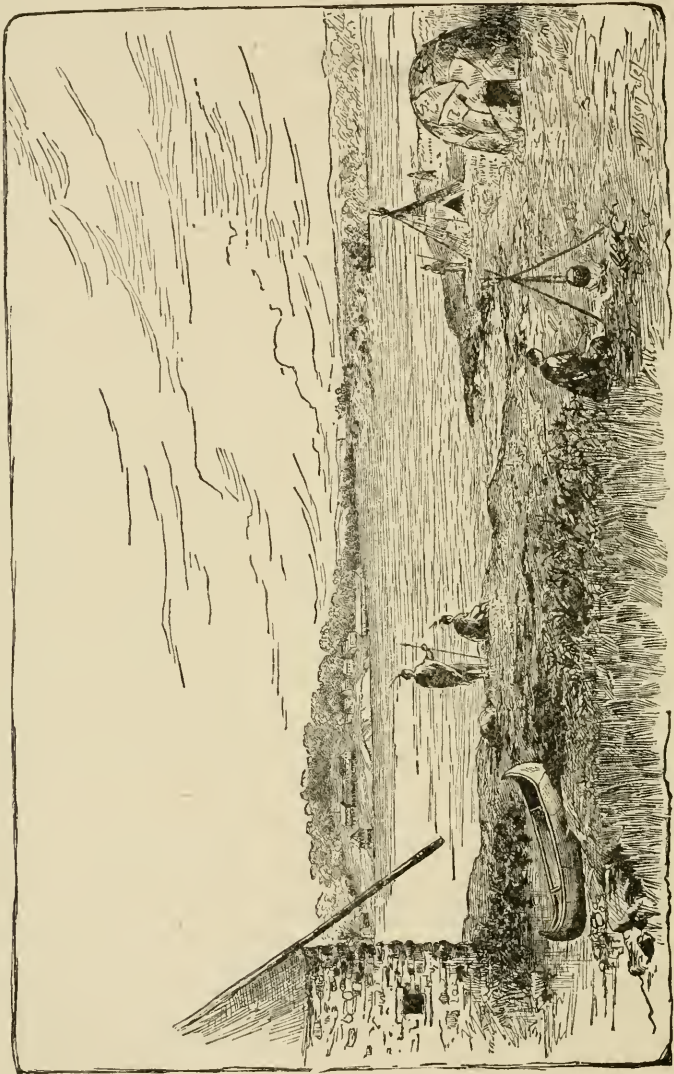


FIG. 1—HUTS OF FISHERMEN AND OF HUNTERS AT SAULT ST. MARIE.

though it is uncertain whether they preceded the age of the palafittes or lake dwellings, or not. The round shape of the lake dwellings is noticeable, a shape which is not confined to the kitchen middens. We are carried back then to the primitive

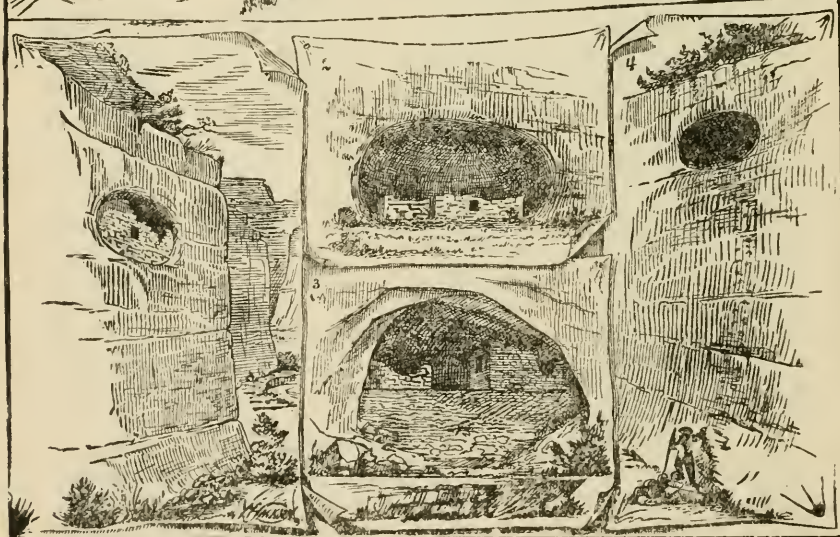
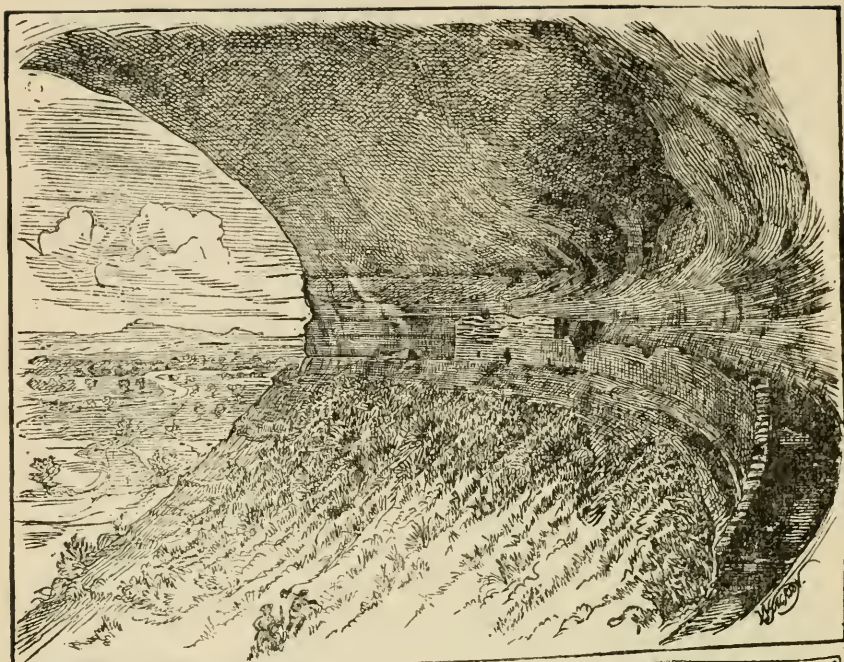
people and to the earliest age by this kind of structure and yet it is not merely true that the fishing period is represented by it. We go to the most primitive people in all lands and find the hemispherical hut. In Africa it is the commonest structure of all. In this respect Rev. J. G. Wood says "that the Africans, especially the Zulus, have no idea of a house, otherwise than as a circular hut. A house with angles to it is the most inconvenient structure possible for them. They do not know what to do with the corners, and in fact have no ability to make corners. If they undertake to draw a straight line so as to make a square, they will get the angles wrong and sides unequal. A circle comes to them as natural as a cell to a bee. Whether the change from the savage to the civilized state seems to have an effect upon the instincts of man, we find this to be true, that the circle changes to a square. It is very remarkable that the mound-builders, especially those in the agricultural state, have both the square and the circle as the models for their village enclosures.

It is interesting to notice that houses resembling this hut are found wherever there is a low grade of society, whether in Africa or America, whether in historic or prehistoric times. They are not confined to fishermen nor are they found only in the Arctic regions, but they seem to be wide spread. They are found in California as well as on the banks of Lake Superior, in the midst of the sand plains as well as upon the ice-fields.

Mr. Powers says: "The round, dome-shaped, earth-covered lodge is considered the characteristic one of California, and probably two thirds of its immense aboriginal population lived in dwellings of this description."* The door-way is sometimes on the top and sometimes directly on the ground at one side. "In the snow-belt of the Coast range and the Sierras the roof must necessarily be much sharper than on the lowlands; hence roof and frame became united in a conical shape, the material being poles or enormous slabs of bark. See Fig. 3. In the very highest regions of the Sierras where the snow falls to such an enormous depth that the fire will be blotted out and the whole open side snowed up, the dwelling retains substantially the same form and materials; but the fire is taken into the middle of it and one side of it slopes down more nearly horizontal and terminates in a covered way about three feet high and twice as long."

Mr. Powers uses the terms "valley-style or dome-shaped, and mountain-style and conical-shaped, to designate the different kinds of lodges," and his generalizations seem to be correct. Still it is a question whether the shape of a lodge or house was not, among all aboriginal tribes, indicative of the previous history, condition and employment of the people.

*See Vol. IV, p. 106, *Con. to Amer. Eth.*



3. As to the question whether the communistic system prevailed among the fishermen and the hunters alike, this arrangement of the interior proves nothing. The size of the house might be used as an argument, but we must consider that polygamy prevailed and it would require a large house to accommodate a family with several wives and numerous children. We would call attention to the cuts from Catlin's work to show that the Mandans dwelt in families and not in clans. The platforms with a central fire were common among the Chippewas on Lake Superior and among the Iroquois of New York State, as well as among the Eskimos. According to Parkman the Iroquois placed their platform some four feet above the ground, and slept both above and below the platform. These constituted a sort of berth, something like the berth of a cabin. We must consider them as mere matters of convenience, which were common in cold countries, giving warmth to the inhabitants, as well as room in the habitation. Of course the number of fires in the house would indicate the number of families, and where there were several we might suppose the communistic system to prevail. In the Eskimo hut, however, there was but one fire. If the Iroquois house contained a clan, there is no reason to suppose that the Eskimo house did. Eskimo huts were generally arranged in clusters, and we can not help thinking that the clusters were arranged so as to make villages, and the village embraced the clan, leaving the house for the family or for the household, that is a family with its immediate relatives. The same was true with the savages who were hunters, and of the Africans who were agriculturists, or herdsmen; they all arranged their houses in clusters, and it seems probable that the clan-life was embodied in the village rather than in the house.

II. We turn now to the houses of hunters. 1. The question arises whether there was any typical structure for the hunting period. We have spoken of the conical hut as distinguished from the hemispherical hut, and have suggested that it was typical of the hunter state. This is the point we are considering. The cone was certainly used by many of the hunter tribes. It was not only among the Algonquins, but the Dakotas and other wandering races. There was a reason, however, for this. The conical tent was easily taken down and transported. There are many descriptions of the ease with which these tents were removed. The covering was stripped off, the poles separated and then placed on either side of the dogs or ponies which were owned by the family or clan; the covering was placed upon the poles, the furniture upon the covering, and the young children upon the furniture. In this way a whole village could be removed in an incredibly short time. The tent which before served as a house now served as a vehicle. It was a mover's wagon which had no wheels, but served the purpose

very well. It is remarkable that the Sibley tent, which was used by our army when marching, and is still used on the frontier, was modeled after the Dakota wigwam. The conical tent or house was very common, and its use was very widespread. We do not regard it as necessarily connected with the hunter stage and yet it may be a good representative. There is no doubt but that the hunters occupied a grade of society which was in advance of that of the fishermen. Their relics would indicate this. Both were in the stone age, but there were different degrees or periods in this age. The use of pottery and of polished stone axes has generally been regarded as a dividing line. Hunters used these; fishermen did not, or if they did they were not as common among them as among the hunters.

The hunter life may be recognized by the shape of the house as well as by the character of the implements. In looking through the series of Catlin's paintings we find the conical hut among the Comanches, the Crows, the Dacotahs or Sioux, and the semi-conical among the Mandans; these were all hunters. Parkman says the Algonquins used the conical hut. It was the typical house for all that region which intervened between the Ohio River and the Great Lakes, and which extended out across the prairies as far as the Staked Plain and New Mexico. It is associated with hunter life, but is more common in the prairie region than in the forests. The wild hunter tribes, who were always on the move, would naturally prefer such a house, for it could easily be taken down and was best adapted to the hunter's life. It was the habitation which was common on the prairies, especially among the Dacotahs.

2. We are next to inquire whether the house architecture of the hunter is an index of their social grade. As to this some would take the position that the form of the lodge was owing to the climate and to the surroundings rather than to the mode of life. Mr. Stephen Powers, in speaking of the California tribes, enumerates several varieties of the lodge constructed by these tribes, and adapted to the different climates of the state. One form was adapted to the raw and foggy climate of the California coast, constructed of redwood poles over an excavated pit; another to the snow-belt of the Coast Range and of the Sierras; another to the warm coast valleys; another, limited to a small area, constructed of interlaced willow poles, the interstices being open; another to the woodless plains of the Sacramento and the San Joaquin, dome-shaped and covered with earth; and another to the hot and nearly rainless region of the Kern and Tulare valleys, made of tule.*

Stephen Powers speaks of the style of lodge sometimes seen among the Hupas, a tribe on the lower Trinity, in Northern Cal-

*See Contributions to American Ethnology, Vol. IV.

ifornia, as follows: "A circular cellar three or four feet deep and twelve feet wide, was dug and the side walled up with stone. Around this cellar, at a distance of a few feet from the edge of it, was erected a stone wall on the surface of the earth. On this wall there leaned up poles, puncheons, and broad sheets of red-wood bark. Sometimes this stone wall, instead of being on the inside of the stone wall, was on the outside on the ends of the poles and served to steady them. In the center of the cellar is a five-sided fire-pit, walled with stone, as in the common square cabin; this cellar is both dining room and dormitory; a man lying with his head to the wall has his feet in comfortable position for toasting before the fire; under his head or neck is a wooden pillow, something like that described by travelers among the Japanese. See *Con. to Amer. Eth.*, Vol. III., p. 74. Here then we have the convenience of construction to be the motive



Fig. 3.—A House Common Among the Sierras.

for the style, rather than the mode of life or history of the people; still we should say that the lodge was an indication of the stage of culture reached by the people; as the more advanced people were able to overcome difficulties and make the construction conform to their ideas, while those in the lower grades would consult only ease and convenience. As a general rule we should say that while there are no hard and fast lines by which we can tell whether a house belonged to a hunter tribe or not, yet the tendency with those who are sedentary in their habits was to erect the hemispherical cabins; but with the nomadic races the tendency was to use the conical tent. This could be easily taken down and moved; but the dome-shaped hut, especially if it was covered with sod or thatched, could only be left to rot down or be destroyed.

Mr. Powers suggests that the mountaineers drew their models from nature herself; the yellow pine, which furnishes the model for the Gothic style of the temple, may have furnished also the model for the primitive house of the people. The pine does indeed shed the snow because of its conical shape, and Gothic houses are common where snow is abundant. So far we think Mr. Powers is correct. Still it is uncertain whether the one was borrowed from the other. There are Swiss houses [among the mountain peaks of the Alps which have sharp roofs, and the two seem to go together, making the landscape unique and beautiful.

We acknowledge the force of these suggestions and yet the grades of society were probably effected by the local surroundings; and in a general way we may consider the mountaineers and inhabitants of the valley as in the same grade with the hunters on the prairies; all having reached the last stage of savagery, or the earliest stage of barbarism.

3. The most important point in reference to the hunter's house is whether the communistic system is indicated by it. We shall need to examine the interiors of the house to ascertain this.

In reference to the internal arrangement of the house, the hunters seem to differ from the fishermen. According to Catlin the hunters generally divided the house into small sleeping apartments, protected by hangings of robes or skins with the robes or furs on the ground for sleeping upon, with a post in front on which hung the arms and implements of the warriors. The Eskimos built platforms around the sides for the sleeping apartments, but had no separate divisions. There was an open space in the middle of both huts, but in the hunter's house skins were hung on the posts near the center and the children were gathered in the space around the fire and were entertained with stories. With the fishermen there were no such hangings, but the hut made one apartment.

We give several cuts to illustrate these points. These are taken from Catlin's book, reproduced by the Smithsonian Institution, and kindly loaned us for use. It will be seen that the Comanches arranged their tents in clusters, that they were all of them conical in shape; they do not seem to have observed any particular order in locating them. On the other hand, the Mandans used the truncated cone as the shape after which they modelled. They always arranged their houses around a hollow square and generally placed their "big canoe," as Catlin calls it, in the center. This canoe represented the traditional vessel on which their great ancestor survived the flood. It served to perpetuate the myth as to the creation and first origin of the race, and was an important object in all their feasts and ceremonies.

Sometimes there was a combination of the two types in one

building, the wall being nearly perpendicular, but the roof being conical. This was the case with the Mandan hut. It was a cone and a sphere combined. It was built with a heavy framework, was covered with poles and then with sod or dirt forming the outer covering, thus making it warm in winter and cool in summer. The following is the mode of construction. Twelve posts are set in the ground at equal distances on a circle, string pieces rest in the forks at the top of the posts, braces are sunk in the ground which slant upward to the top of the wall; slabs of wood are set in the spaces between the braces, resting against the stringers, (see Fig. 4,) surrounding the lodge with a wooden wall; four round posts are set in the ground near the center of the floor, ten to fifteen feet high, ten feet apart; string pieces are placed upon the tops of these; poles are placed as rafters on these stringers; these poles are covered with willow matting, upon which prairie grass was over spread and over all a deep covering of earth; an opening was left in the center of the roof for the exit of the smoke, there was but one entrance, protected by what

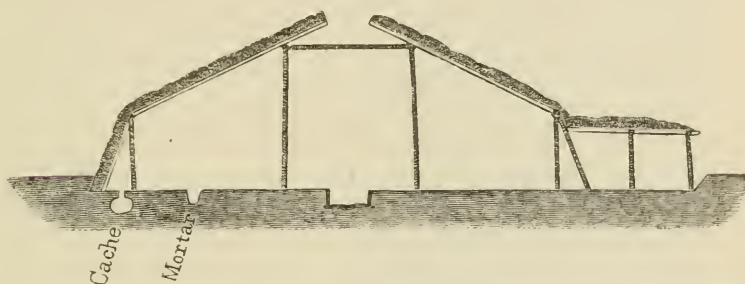


Fig. 4.—Plan of Mandan House.

has been called the "Eskimo doorway," that is, by a passage five feet wide, ten or twelve feet long and six feet high; each house was divided into compartments by screens of matting or skins suspended from the rafters; these compartments opened toward the central fire, having a central area around the fire-pit, which was the gathering place of the inmates.

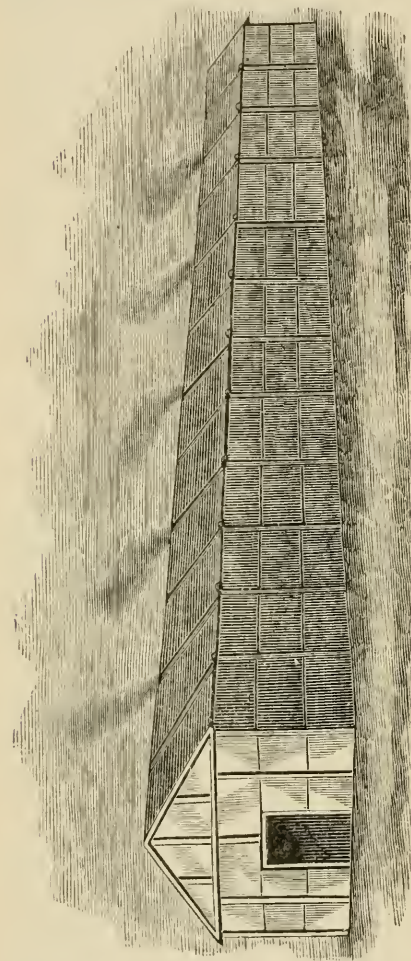
III. We are next to take up the houses of the agricultural races. We are brought back from our wanderings among the mountains of California and among the prairies of the west to the regions south of the Great Lakes adjoining the Atlantic coast and the Gulf States. This was the region occupied by the agricultural people in prehistoric times. "We begin with the houses of the Iroquois. Mr. L. H. Morgan has furnished a description of these, though his description differs from that of Mr. Parkman. The Iroquois house was undoubtedly very much like that of the Powhattan tribe in Virginia. This has been pictured by the painter Wyeth, and we know exactly how it was built. It was a house, according to Mr. Parkman, whose roof

was bent in the form of a semi-circle with the sides perpendicular; the ends square; the whole structure being rectangular, but being much longer than broad.

Mr. L. H. Morgan has represented them as having an angular, peaked roof, instead of a rounded one. The picture of a palisaded fort and village of the Onondagas contains representations

of the houses of the Iroquois. These are in clusters, but the most of them seem to have rounded rather than peaked roofs. We may conclude then that this was the typical house, among all the agricultural tribes of the Mississippi Valley, both historic and prehistoric; at any rate, it was the structure which was discovered by the early explorers both in Florida, throughout the Gulf States, and as far north as Virginia, North Carolina and Tennessee. It is very probable that it was the structure which prevailed among the Mound-builders of this region. Mr. Morgan's description of the so-called long-house was taken from the Journal of a Voyage to New York, taken in 1676, 200 years ago, by Jasper Dankers and Peter Sluiter, but we regard the picture of the fort taken in the time of Champlain in 1615 as more correctly representing the prehistoric times. The following is the description: "Their

Fig. 5—Long House of the Iroquois,



house was low and long, sixty feet long, fourteen or fifteen feet wide; the bottom was earth; the sides and roof were made of reed and the bark of chestnut trees; the posts or columns were limbs of trees stuck in the ground and all fastened together; the top or ridge of the roof was open about half a foot wide from one end to the other, in order to let the smoke escape, in place of a chimney; on the sides of the walls of the

house the roof was so low that you could hardly stand under it; the entrance or doors, which were at both ends, were so small and low that they had to stoop down and squeeze themselves in order to get through them; the doors were made of reed or flat bark; in the whole building there was no lime, stone or lead."*

Mr. Morgan's restoration of the "long house" of the Seneca-Iroquois does not quite correspond with the facts, or at least does not quite represent the typical structure of the agricultural races. The houses of the natives of the South were all of them with bent or semi-circular roofs, and this, we think, was nearer the type of house which was common among the agricultural races. Mr. Morgan's reconstruction of the Mound-builder's house is also faulty. We do not know what that house was; it probably varied with the different tribes and races. In some of the Mound-builders' districts there are circular ridges or rings which show that the lodges were either conical or hemispherical and not rectangular. Such is the case in Tennessee and in Missouri. In the Southern States it is very probable that the Mound-builder's house was rectangular; at least the pyramids had that form and it is probable that the superstructure conformed to the foundation. There are many rectangular platforms among the earthworks of Ohio; these probably had square houses upon them; there are also many circular enclosures in which circular houses must have been the structure which formed the habitation.

In reference to the communistic system, Mr. Morgan, who was the first author who has brought this system to light, maintains that the Iroquois long-house embodied it, but that it was a system which prevailed extensively and was embodied in other houses as well as this. We call attention to Mr. Morgan's description of the house of the Iroquois because it seems to us that there is just enough difference in the houses to disprove this position. The long-house of the Iroquois was from 50 to 80 and sometimes 100 feet long. The interior of the house was comparted at intervals of six or eight feet, leaving each chamber entirely open like a stall upon the passage way which passed through the center of the house from end to end. At each end was a doorway covered with suspended skins. Between each four apartments, two on a side, was a fire-pit in the center of the hall, used in common by their occupants. Thus a house with five fires would contain twenty apartments and accommodate twenty families, unless some apartments were reserved for storage. Each house, as a rule, was occupied by related families, the mothers and their children belonged to the same gens, while their husbands and the fathers of these children belonged to other gentes, consequently the gens or clan of the mother

*See Con. to Amer. Eth. Vol. IV., p. 118.

largely predominated in the household. Whatever was taken in the hunt or raised by cultivation by any member of the household, as has been elsewhere stated, was for the common benefit."* We must remember, however, that the houses of the Aborigines were not often like the long-house. They were divided into compartments, but the majority of them were much smaller and would accommodate fewer people. We have maintained that it was the village enclosure which accommodated the clan and that the communistic system embodied itself in the village, but that the house was built for the family and not for the clan. Without denying what has been said about the Iroquois we hold that the Indians generally had their families and immediate relatives in the house very much as white people, but that they made their villages the abode of the families that were related, in other words, the home of the clan. All that Mr. Morgan has said about the obligations and privileges of the clan we believe to be true, but the hospitality of the family would be accounted for by the clan system. One family could borrow from another in the village, and the clan system would make it an obligation to lend or give; but this does not prove that every house contained a clan or that every family in the clan had an absolute right to what the rest had. The communistic system did not necessarily extend through the whole village; the family may have had all things in common, but this does not prove that the clan did. This is an important distinction. The house accommodated the family, and all things may have been common to those dwelling in the house, but the village enclosure accommodated the clan and only the land and the public store was the common property of the clan.

Mr. Morgan lays down five heads or elements as peculiar to communism—the law of hospitality, communism in living, the owning of lands in common, the practice of having but one meal prepared a day, a separation at meals, the men eating first, and the women and children afterwards. All of these elements were embodied in the family, but it is doubtful whether they were common except among the Iroquois and among the pueblo tribes of the West; and there is some uncertainty in our mind that even as to the Iroquois themselves. We acknowledge that there was a communistic system and that communistic life in some of its features was practiced among the agricultural races; but we can hardly believe that it was so universal and so pervasive as Mr. Morgan makes it out to be.

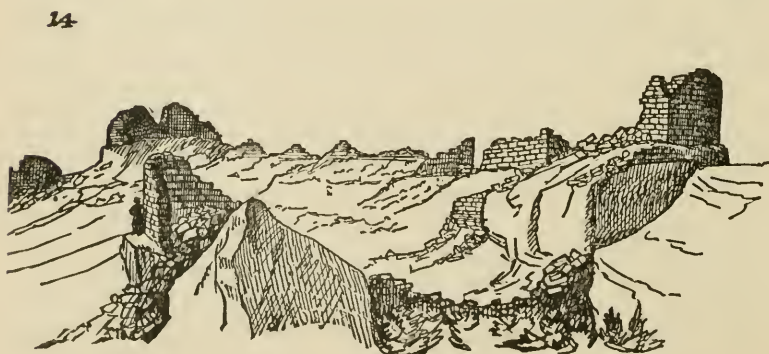
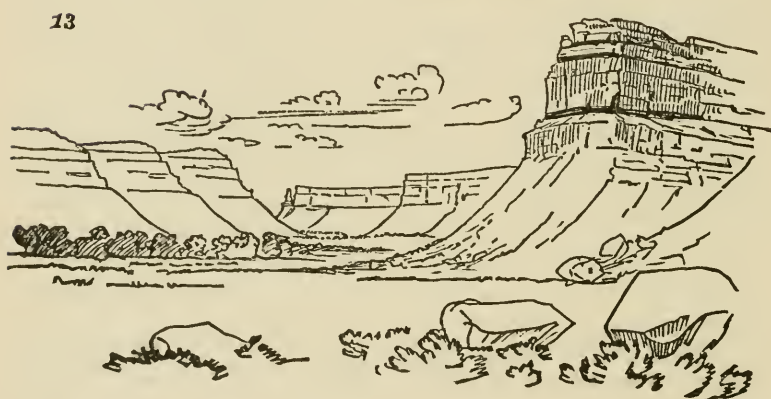
IV. We now turn to the houses of the village Indians. Here the communistic life reached its height. If we would study the system we must look to these pueblos, for they embodied it with the greatest perfection. The pueblos were un-

*Con. Amer. Ethn., Vol. IV., p. 121.

doubtedly communal houses. They seem to be in great contrast with all others. They are not built separately, but seem to have been built in great blocks; a single block containing many tenements and running up to several stories in height. The many-storied or terraced pueblo is the typical structure for village Indians. How this type came to be introduced is a question. There is a mystery about it. It is certainly a remarkable style of building and there are no steps by which we can trace a development of architecture from a lower stage to this. There are, however, three principles which may to a certain degree account for the style of architecture. In the first place, the house was made the abode of a clan or tribe, the communistic system having found its complete development in this. In the second place it was erected as a defense and like the old block-houses of the times of the French and Indians war was made more than one story high; the lower story being closed against an enemy and the upper story serving as a place of attack. The third point is that the pueblo was erected in the place where the population was necessarily gathered into the center, the system of irrigation requiring a combination. The water was drawn from a running stream, taken at a point above the pueblo, carried down through a series of garden-beds, and the people used it and cultivated the ground together; this made the residence of the people compact.

Mr. Morgan says: "These houses represent together an original indigenous architecture, which with its diversity sprang out of their necessities." "Its fundamental communal type is found not less clearly in the houses about to be described in the so-called palace of Palenque, than the long-house of the Iroquois." The degree of their advancement is more conspicuously shown in this house architecture. Each pueblo was an independent organization under a council of chiefs, except as several contiguous pueblos, speaking dialects of the same language, were confederated for mutual protection. "Throughout all these regions there was one connected system of house architecture as there was substantially one mode of life." Mr. Morgan also speaks of the defensive character of these pueblos. He says:

"The pueblos now in ruins throughout the original area of New Mexico, and for some distance north of it, testify to the perpetual struggle of the former to maintain their ground as well as to prove the insecurity in which they lived." The Indians north of New Mexico did not construct their houses more than one story high, or of more durable materials than poles covered with matting or bark or coated over with earth. A stockade around their houses was their principal protection. In New Mexico going southward they are met for the first time. That the means of subsistence required a compact settlement will be evident to any one who examines the country, and thus



CLIFF DWELLINGS AND THEIR SURROUNDINGS.

comes to understand the necessities of the case. Village life found its complete development in this region, as irrigation required a combination of effort and favored residence in villages. The village, however, became so compact that it was at times embodied in a single pueblo or terraced building. There were, however, many villages which contained several pueblo houses. The village of Zuni, which is of modern date, has a large number of these pueblo houses. As to the situation of these villages some have supposed that they were originally placed upon the mesas or inaccessible cliffs; and that those which are found in the valleys are of a modern origin. Mr. Mendelieff, who has explored and surveyed many of them, is of the opinion that there were three eras or epochs; that in the earliest period they were located on the bottom lands in the canons, later were moved to the mesas for defense, and then at a modern date were moved back again to the valleys.

The pueblos have been compared to the cliff dwellings, as the same cause which will account for the pueblos being upon the mesas, may account for the cliff dwellings being in the sides of the cliffs; namely, to escape danger. At an early period in history there was a prolonged attack upon the people, and there was no other way of escape than to build their houses in the sides of the cliffs. In studying the cliff dwellings we find that the same elements were combined in these that were in the pueblos. There was the same communistic system embodied in them, notwithstanding the difficulties of the case. There was also the same means of subsistence, but the element of defense was the one which ruled.

We can realize something of the fear of the people from the height at which their houses were placed, some of them being a thousand feet above the valley and hanging like bird's-nests amid the crevices. The communal system was here subordinate to the desire for defense, and yet it was continued, clans and families making their retreat in these fastnesses. All the elements of village life were embodied, notwithstanding the inconvenient situation in which the village was placed. If we can imagine a pueblo to be taken up bodily and dashed against the side of an immense precipice, the rooms thrust into the niches and caves, but the walls scattered and built among the shelters, we will have a picture of the cliff-dwellings; for all of the rooms, including the dwelling, the store-houses, the estufas or "sweat-houses," are found in these cliffs or caves, the terraces and outside walls only being absent. Frequently the order was reversed, for the store-houses were above the dwellings and the estufas were above the store-houses; each being reached in turn by steps which were cut in the side of the rock. If we imagine the side of the precipice to answer for the wall of the pueblo, the steps in the rock to answer for the ladder, the cave floor to answer for the terrace, and the sides of the caves to

answer for the division walls, we have the pueblo restored. There were many of these caves in which there were springs or fountains, and it is supposed that all the conveniences of domestic life were secured in these strange retreats; social and domestic life were thus provided for in the caves. Where a village could not be accommodated the people made a virtue of necessity and placed their families in one niche, their stores in another, and their places of assembly or *estufas* in another. There were breast-works or walls on the edge of the cliff to keep the inmates from falling, and so children were safe. For subsistence they either passed down the sides of the cliff to the garden patches below, or climbed up to the fields, which were scarce, on the mesas above; possibly a combination of the two brought a living to the people. That the cliff-dwellings and pueblos were built on the same general plan and by the same class of people is evident. The pueblos are frequently seen on the top of the rocks or isolated mesas, the buildings arising in different stories above the cliffs, but sheep enclosures and garden patches being placed on the benches below the cliffs. In some of these the whole cliff or mesa seems to be terraced, the rock itself with its terraces or benches forming a model for the buildings above.

As to the style of building these pueblos there seems to be a difference of opinion. Mr. L. H. Morgan, H. H. Bancroft, W. H. Jackson, Lieut. J. C. Ives, and Gen. J. H. Simpson have all described the pueblos, and the most of them imagine that the walls were perpendicular upon one side and in terraces upon the other; the terrace being regular so as to make a connected platform along the whole front. Other authors who have examined the buildings more recently maintain that they were built in successive stories, but that the platforms or terraces were at different levels and frequently faced away from the court as well as toward the court, in fact extended around the four sides.

Gen. Simpson was the first one to discover the pueblos. His report contains an account of the most important. Lieut. Ives says: "Each pueblo is built around a rectangular court, in which, we suppose, are the springs that furnish the supplies to the reservoirs. The exterior walls, which are of stone, have no openings, and would have to be scaled or battered down before access could be gained to the interior. The successive stories are set back one behind the other. The lower rooms are reached through trap-doors from the first landing. The houses are three rooms deep and open upon the interior court. The arrangement is as strong and compact as could well be devised, but as the court is common and the landings are separated by no partitions it involves a certain community of residence." A restoration of the pueblo of Hungopavie made by Mr. Kern, who accompanied Gen. Simpson as draughtsman, will give an

idea of the manner in which the pueblos were built. Mr. Morgan says: "We may recognize in this edifice a very satisfactory reproduction of the palaces of Montezuma, which like this were constructed on three sides of a court and in the terraced form." Lieut. Simpson, in his report, has furnished ground plans of five of these structures with measurements. They are all constructed of the same material and upon the same general plan. They contain from 100 to 600 apartments each, and would severally accommodate from 500 to 4,000 persons. Lieut. Simpson, speaking of the pueblo of Pintado, says: "Forming one structure, and built of tabular pieces of hard, fine-grained, compact, gray sand-stone, (a material entirely unknown in the present architecture of New Mexico) to which the atmosphere has imparted a reddish tinge, the layers or beds being not thicker than three inches, and sometimes as thin as one-fourth of an inch, it discovers in the masonry a combination of science and art which can only be referred to a higher stage of civilization and refinement than is discoverable in the works of Mexicans or Pueblos of the present day." The thickness of the main wall at the base is about three feet; higher up it is less, diminishing every story by retreating jogs on the inside, from bottom to top. The series of floors indicate that they must have been originally three stories.

The system of flooring seems to have been large, transverse, unhewn beams, six inches in diameter, laid transversely from wall to wall, then a number of small ones laid longitudinally upon them; brush, bark or slabs placed upon these and covered with a layer of mud mortar. The beams show no signs of the saw or axe. On the contrary, they seem to have been hacked off by some very imperfect instrument. On the ground floor are fifty-four apartments, some of them as small as five feet square, the largest about 12x6 feet. The rooms communicate with each other by very small doors, some of them as contracted as $2\frac{1}{2} \times 2\frac{1}{2}$ feet; and in the case of the inner suite, doors communicating with the inner court as small as $3\frac{1}{2} \times 2$ feet. See Fig. 6. The principal rooms, or those most in use, on account of their having larger doors and windows, were probably those of the second story. Lieut. Simpson says: "In the northwest corner of the ruins we found a room in almost a perfect state of preservation. This room was $14 \times 7\frac{1}{2}$ feet in plan and 10 feet in elevation. It has an outside door $3\frac{1}{2}$ feet high by $2\frac{1}{4}$ wide; one at its west end, leading to the adjoining room 2 feet wide.*

The pueblo Bonito is thus described: Its present elevation shows that it had at least four stories of apartments. The number of rooms on the ground floor is 139, making a reduction of one range of rooms for every story after the first would increase the number to 641. One of the best rooms as shown

*Fig 34, Con. Amer. Eth., Vol. IV., p. 162.

in the engraving, was drawn by Mr. Kern. "It is walled up," says Simpson, "with alternate beds of large and small stones, the regularity of the combination producing a very pleasing effect; the room has a doorway at each end and one at a side; each of them leading into adjacent compartments. The light is let in by a window 2x8 inches, on the north side. The mod-

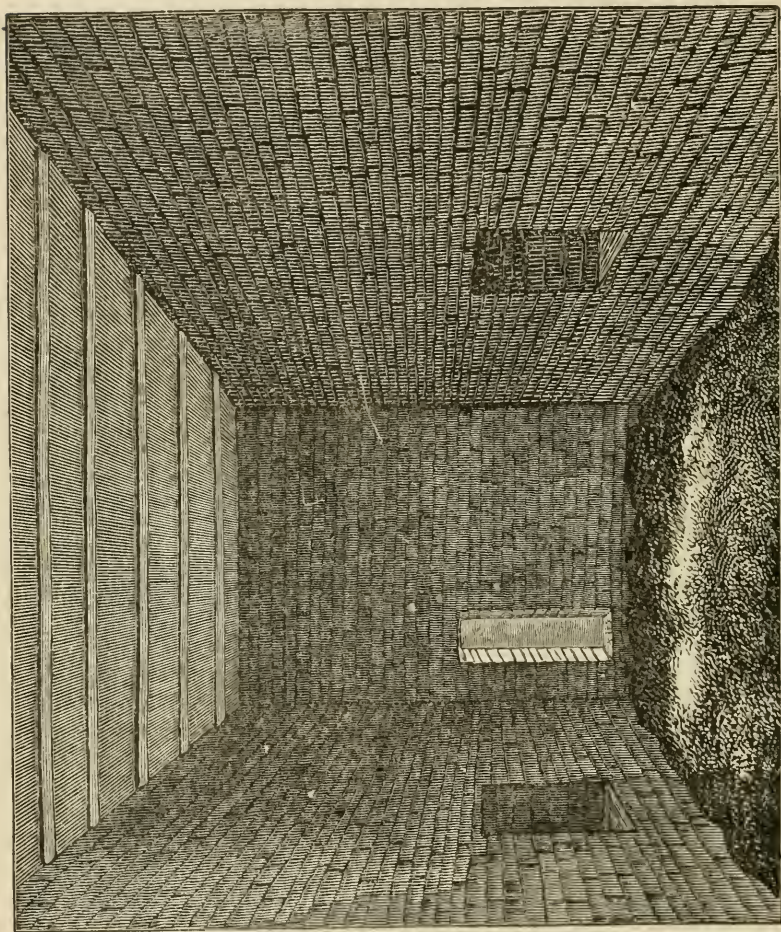


FIG. 6—ROOM IN A PUEBLO.

ern pueblo room differs from this one in that chimneys are erected in them and wider doors open from them. Yet the same general characteristics are retained. See Fig. 7. Mr. John Ward, Indian agent, has given description of these: "No room has more than two windows, very few have more than one. The first story, or the ground rooms, are usually without doors or windows. The only entrance being through the doors

or scuttle hole in the roof, which are within the rooms comprising the story above. The basement rooms are used for store-rooms. Those in the upper story are the rooms mostly inhabited; those located in the front part of the building receive their light through the doors and windows before described; the back windows have no light than that which goes in through the scuttle-holes and the partition walls leading from the front rooms. Some families have as many as four or five rooms, one of which is set apart for cooking, and is furnished with a large fire-place for the purpose. Those who have only two or three rooms usually cook and sleep in the same apartment and in such cases they cook in the fire-place which stands in one corner of the room*.

In reference to the arrangement of the stories it would seem as if the restorations which have been given, hardly convey the right idea. No pueblo has been discovered which has terraces arranged as regularly as these represent them to be. The most of the photographic pictures of them convey a more correct idea.

In these the pueblo is a pile of buildings, but only portions of the building reach to the fifth story. Mr. Ward says that "there is no regular terrace, no entire circuit can be made around any one of these stories; the only thing that can be called a terrace being the narrow space left in front of some of the rooms from the roofs of the lower rooms."

Lieut. Joseph C. Ives visited Moqui pueblos near the Little Colorado in 1858. They are seven in number, situated upon mesa elevations within an extent of ten miles, difficult of access and constructed of stone. As to the population of these buildings, there seems to be a great diversity of opinion. It will be acknowledged that they were built for the accommodation of large numbers; though we think the numbers have been exaggerated.

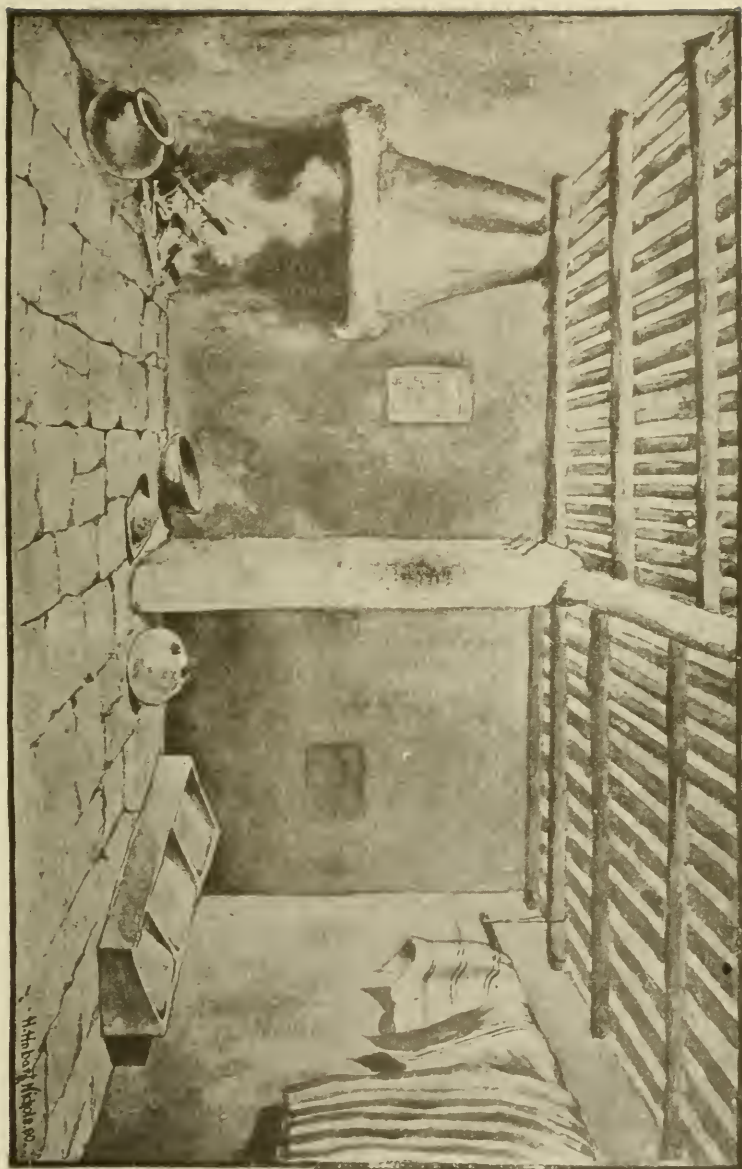
Yet Lieut. Ives says: "We came upon a level summit and had the walls of the pueblo on one side and an extensive and beautiful view on the other. The town is nearly square, and surrounded by a stone wall fifteen feet high, the top of which forms a landing extending around the whole of it. The faces of the bluff have been ingeniously converted into terraces; these were faced with neat masonry and contained gardens, each surrounded with a raised edge, so as to retain water upon them. Pipes from reservoirs permitted them to be irrigated at any time."

There are eleven pueblos in the Chaco canon within a distance of nine miles; this would make a population exceed the densest population in civilized countries. The modern pueblo of Zuni contains no less than 12 or 15 pueblo houses. Figuring from the estimates of Mr. Morgan it would contain 16,000

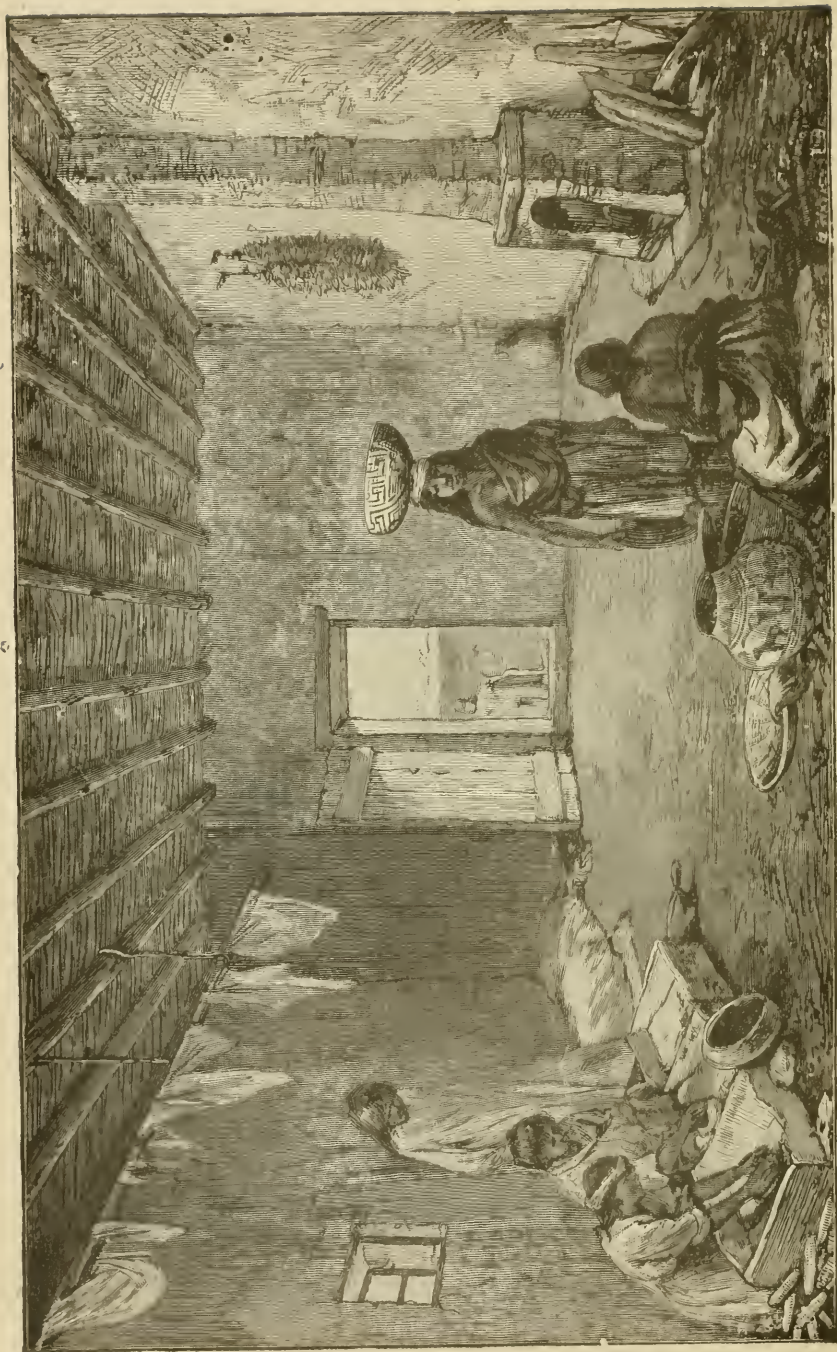
*Fig. 28, Vol. IV., *Con. to Amer. Eth.*, p. 148.

inhabitants, while as a matter of fact it contained only 1,600. We must reduce the number of families in each pueblo to reconcile the estimates with the facts. This does not, however, conflict with the idea that there was a communistic system. Mr. David J. Miller says: "Their government is composed of the following persons: A cacique, or principal sachem, a governor or alcade, a lieutenant governor, war captain, six fiscals or policemen. The cacique has the general control of all officers in the performance of their duties." Mr. Morgan says: "At the time of the discovery the pueblo Indians of New Mexico worshipped the sun as their principal divinity. They had periodic assemblages of the authorities and the people, in the estufas, for offering prayers to the sun, to supplicate him to repeat his diurnal visits, and to continue to make the maize beans and squashes grow for the sustenance of the people." Mr. Jackson describes the estufas: "They are each 25 feet in diameter; the inside walls are perfectly cylindrical, and in the case of the inner one are in good preservation for the height of about five feet. * * * There are no side apertures, so that light and access were probably obtained through the roof. These *estufas* which figure so prominently in these ruins, and in fact in all the ancient ruins extending southward from the basin of Rio San Juan, are so identical in their structure, position, and evident uses with the similar ones in the pueblos now inhabited, that they indisputably connect one with the other, and show this region to have been covered at one time with a numerous population, of which the present inhabitants of the pueblos of Moqui and of New Mexico are either the remnants or the descendants."*

*Con. to Amer. Eth., Vol. IV., p. 158.



INTERIOR OF A ZUNI HOUSE.



INTERIOR OF ZUNI HOUSE.

CHAPTER XIII.

ETHNIC STYLE IN AMERICAN ARCHITECTURE.

The prevalence of an Ethnic style of architecture among the early historic races has been recognized by all, and the names which have been given to the different styles are familiar. The question before us is as to the manner in which these various styles arose and the way in which they came to be so generally adopted and so well established; in other words, what were the beginnings of the architectural styles.

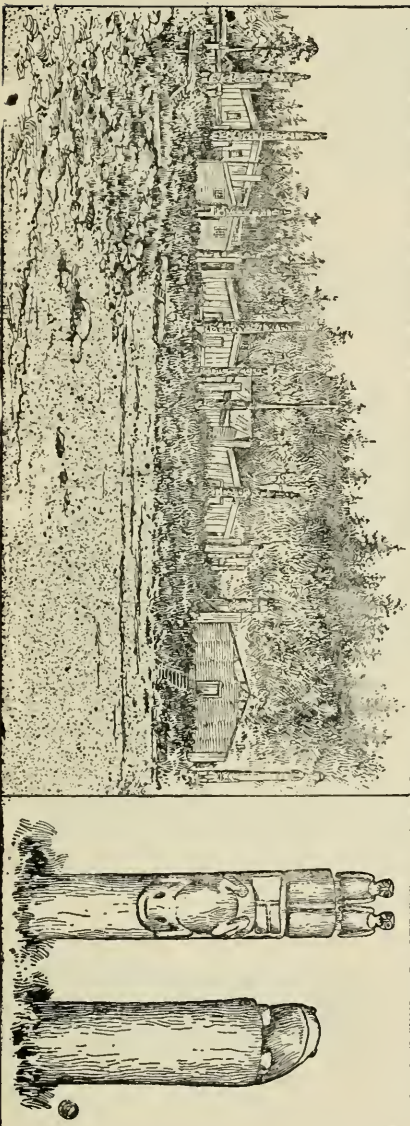
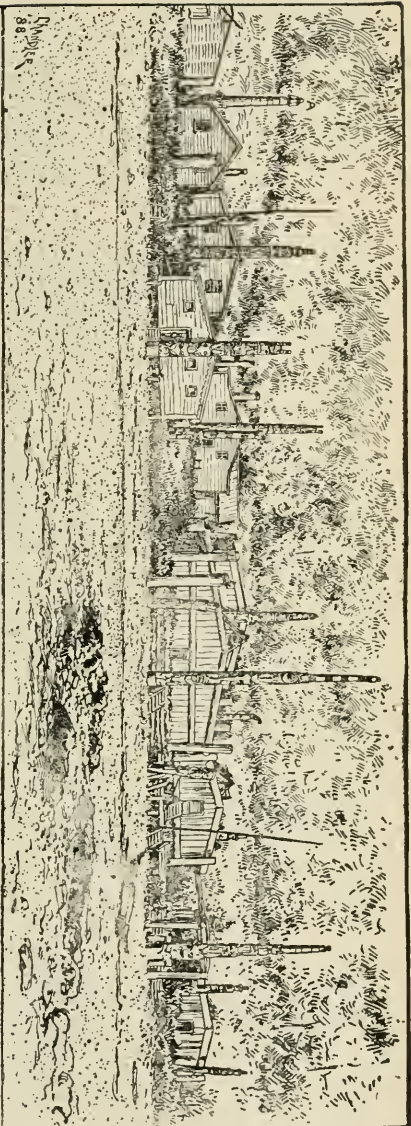
It is, however, a question which we do not expect fully to answer, but merely to throw out a few hints, and especially hints which have been received from the study of the various styles of construction and ornamentation which formerly existed on the American continent.

Every one knows that the Egyptians, at an early date, adopted a style of architecture which they transmitted and which is to this day distinctive and is called Egyptian style. The same is true of the Assyrians, the Greeks, the Romans and the Goths, all of whose styles continue to the present time and are easily recognized and distinguished. The same is also true, to a certain extent, of the Chinese, the Hindoos, the Tartars or Turks, and Arabs, for all of these nations of the east impressed themselves upon their architectural works and have transmitted their ideas and methods of construction through all the generations. We do not claim for America that there was any such general national style as existed in the old world, for there was no one nation, the continent being too large and the geographical districts too diverse to admit of this, but we do claim that there was on this continent a large number of tribes or stocks, each of which possessed a style peculiar to itself, the elements of which can be easily analyzed and accounted for. These elements, in a general way, may be classified under the heads of the material that was used, the method of construction which was common, the general style of ornamentation which prevailed, and the form, shape and plan of arranging the houses which were peculiar to the different tribes, for in these same simple and rude tribal methods of expressing their thoughts and tastes and religious ideas, we may find the germs from which all the great national styles and orders have grown, and for this reason they are worthy of close study.

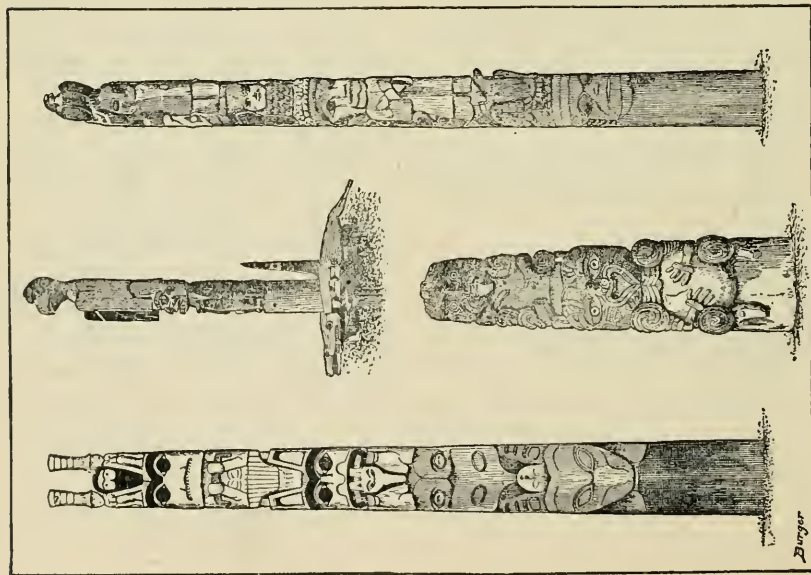
We do not claim for this continent any of the so-called

orders, for these were totally unknown here, though the distinction between style and order should be drawn, for orders were introduced by the Greek tribes, i. e., the Doric from the Dorians, the Ionic from the Ionians, and the Corinthian from Corinth, but these orders were not known or practiced by the other nations of the east until a very late period, and were never practiced by the native races of America. There were in America styles which were confined to tribes, just as there were in Greece, orders which belonged to and bore the name of the Greek tribes, the number of styles here in America being equal to the number of tribes or collection of tribes, even as the number of orders in Greece were equal to the number of nations or tribes in Greece. Nor do we claim for America that there was one general style or order, for this would imply that there was an American nation, whereas there was here only a number of tribes, though every tribe had its own method of constructing the houses they lived in, its own method of arranging those houses in a village, and its own style of decorating the houses, the style being derived from the mythology which prevailed. We may say further that the tribes which were situated in certain large geographical districts were so influenced by their surroundings that it was not so much an individual tribe as a collection of tribes which impressed themselves upon the architecture, and the style which prevails in any one district is not so much tribal as it is geographical, and characteristic of the locality rather than of the people. There was, to be sure a habit of borrowing from one another which prevailed among the tribes which dwelt near together, which strengthened and intensified this tendency to merge the tribal into the geographical style, thus making a sort of middle ground between the tribal and national, but with enough diversity for us to recognize the elements which were blended together and decide as to what was the specific type which each tribe had adopted for itself, making the classification what may be called ethnic or tribal styles. We may well take the geographical districts and speak of the peculiarities which were characteristic of the collective tribes rather than the single tribe.

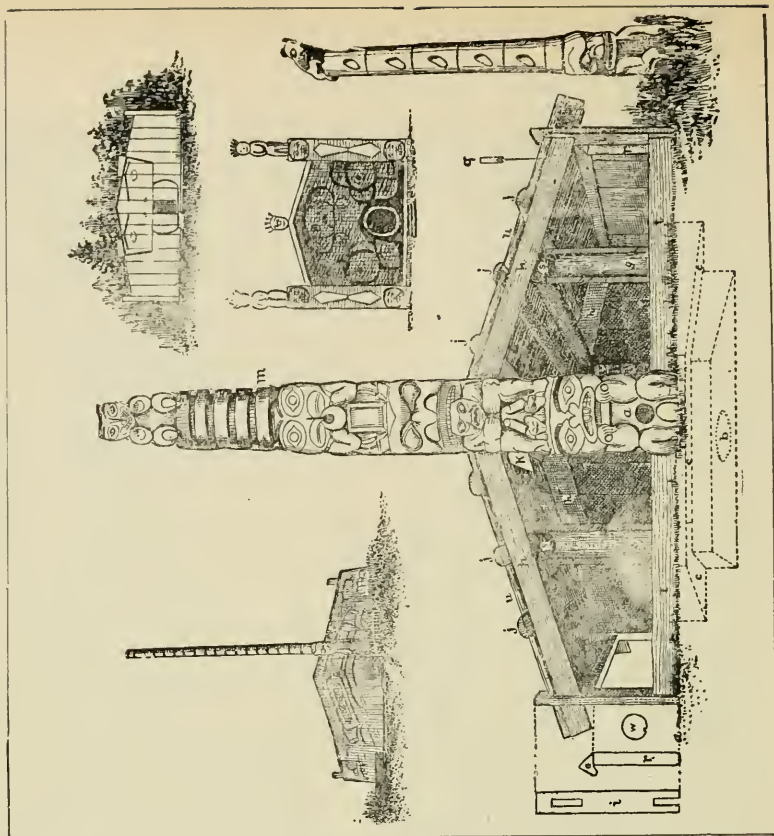
The following is the list of tribes which we may say in a collected capacity have shown a style of house construction and style of ornamentation which were characteristic and which in a general way may exhibit the ethnic traits. Considered geographically, they may be said to begin at the far north and to make two distinct lines, one on the west and the other on the east. The Alaskans occupying one district had one general style of architecture. The Thlinkeets, who dwelt on the northwest coasts where forests abounded and where the sea furnished a great variety of food, had another style and used wood as material, while the Pueblos, who dwelt in the interior



TOTEM POLES AND HOUSES ON NORTHWEST COAST.



TOTEM POLES.



HOUSES ON THE NORTHWEST COAST.

among the cliffs of Arizona and New Mexico, had an entirely different style, stone being the material used, the terraced house being the typical form. Tribes, who dwelt in Mexico and Central America, had a style which was somewhat similar and used the same material—stone—though their ornamentation was entirely different. Thus we find along the Pacific coast five general divisions or geographical districts over which definite and distinct styles of structures were distributed and can be easily recognized. A similar division can be recognized along the Atlantic coast.

The Esquimaux first, at the extreme north; the Canadian tribes second; the wild tribes which were scattered along the Great Lakes third; those on the Ohio River a fourth, and the tribes situated along the Gulf States a fifth. Ten distinct styles of constructing and ornamenting their houses may thus be seen in North America, all of which were different from those which existed among the Peruvians of South America and the tribes east and south of Peru.

As to the manner in which these different styles arose there may be a difference of opinion, yet there is no doubt that much was owing to environment, for the method of construction would naturally depend on the material which was the most abundant. The ornamenting would depend largely upon the mythology which prevailed. The arrangement of the houses in the villages would also depend upon the circumstances, for those who were situated along the seacoast would naturally make their houses front the sea, but those who were situated in the deep interior, where enemies were numerous and means of subsistence scant, would naturally live together and make their houses their fortress as well as the home of the entire tribe. On the other hand, those tribes who dwelt in the rich valley of the Mississippi would naturally make earth walls for their defense and gather their villages within the walls, while those living on the flood plains of the south would build pyramid mounds and resort to these in time of great freshets, the necessities of the case and influence of environment being sufficient to account for the different kinds of villages and for the different methods of defense.

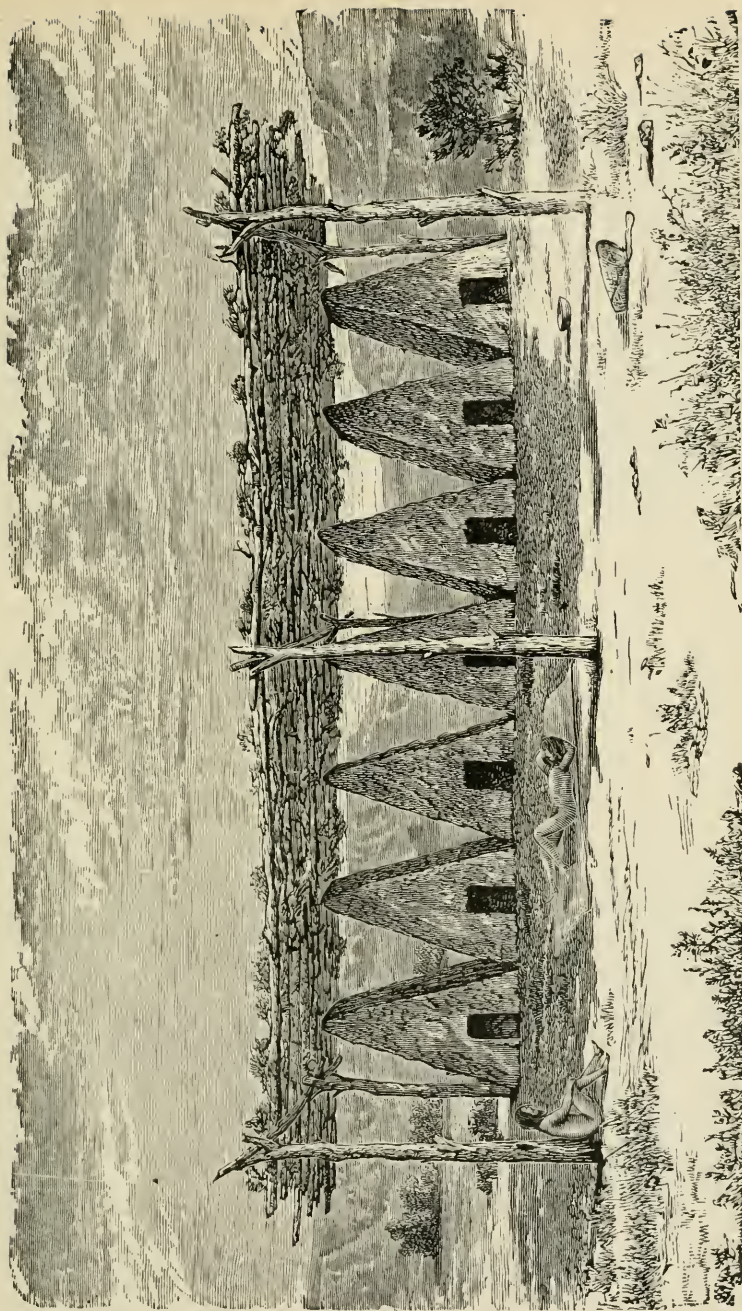
In this respect the architecture of America differs from that of any other country. Here the districts which are bounded by certain geographical and climatic lines, are as distinct from one another as if they were upon different continents. The style of building, as well as of ornamenting, are also peculiar to each district and rarely go beyond certain territorial boundaries. A wide region intervenes between these districts where no particular style is recognized, but in other countries there is no such limitation.

The thought which is forced upon us by the works which

appear on this continent, is that society here had not reached that stage where the sense of proportion and beauty had come into full exercise, and yet there was an influence which came from mythology and a certain unconscious taste which was engendered by it, which gave a peculiar character to the works and structures which were erected by the people of the same general locality or geographical district. This character we may ascribe to the people as an inheritance, and say that it has come down from an ancestral religion which embodied itself in the ornamentation. The styles were in this sense all traditional. The compelling idea was derived from the religious beliefs and mythologies which prevailed, though the material used, the purpose of the building, the proportions required, were dependent upon other causes than those which affected the ornamentation. In other words, the religion and mythology of the different tribes affected the ornamentation, but employment, means of subsistence, climate and other physical causes, affected the construction. There was no one style of architecture in America, but as many styles as there were systems of mythology, for the ornamentation was always borrowed from the mythology which prevailed in the region. Illustrations of this are numerous, for we find on the northwest coast ornaments in which the figures of the creatures of sea and forest and certain strange monsters are conspicuous. In the prairie region of the West we see the tents ornamented with birds, plants and animals peculiar to that region. In the Gulf States there were formerly carved figures with the human form in grotesque attitudes, serpents, idols which combined the heads of different animals, and a great variety of nondescript creatures, all carved out of wood, while in Mexico and Central America we see a great variety of figures carved upon the facades of the palaces, the serpent being the most conspicuous but human figures and faces are very prominent, all of which represented the mythologies and forms of religion which prevailed there.

Illustrations of these points may be found among the living tribes, for each tribe presents a different architectural style. To illustrate: The round house of the Eskimos, the long house of the Iroquois, and the square house or the houses around the square of the Mobilians, are all indicative of different modes of government and different customs and conditions.

We take then the tribes situated along the Pacific, especially those of the northwest coast. Mr. H. H. Bancroft has described these. He divided them into several classes, as follows: 1. Hyperboreans; 2. Columbians, Californians; 3. New Mexicans; 4. wild tribes of Mexico; 5. wild tribes of Central America. He has given descriptions of the peculiarities of each. From his



TEPEES OF THE CALIFORNIA INDIANS.



HOUSES OF THE COMANCHES.



HOUSES OF THE MANDANS.

descriptions we learn that different districts were occupied by different tribes, and that tribes differed in their employment, means of subsistence, social organization, types of architecture, as well as art products.

Mr. Bancroft's division of the tribes seems to be somewhat arbitrary, as it is based mainly on the geographical location, without regard to language or race affinities. Still so far as architecture is concerned, it seems to be an excellent one, for the centers of population correspond with the architectural centers so closely that a division of this kind enables us to understand the subject clearly. An argument might be drawn from this, to be sure, to prove that the architectural qualities were altogether the result of geographical surroundings and that ethnical qualities had nothing to do with them. We acknowledge that there is much force in this thought, and are ready to recognize the fact that styles of building, as well as modes of living, were influenced

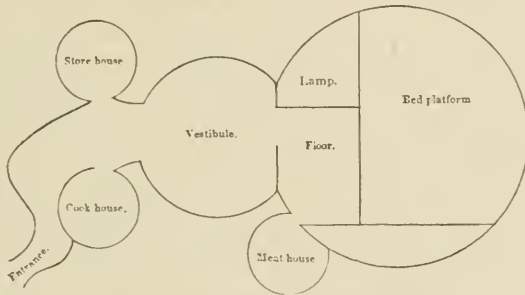


Fig. 1—Ground Plan of an Eskimo House.

by the geographical causes, such as climate, means of subsistence and material for building. Still the tribal emblems of each tribe and race, we think, may also be recognized in these material structures. This will be seen as we proceed.

1. We take first the Hyperboreans. Here we find five classes of people and five centers of population, all of them included under one general head, as follows: Eskimos, Koniagas, the Aleutians, the Thlinkets and Tinnehs or Athabascans. All of these are still dwelling under the shadows of the midnight sun and drawing their subsistence from the waters which permeate the frozen regions of the north. Their surroundings were very similar, their subsistence similar and their modes of life corresponded to their subsistence. We find, however, from their language, customs, and modes of architecture, the prevalence of totemism in the whole region. Bancroft says: "In all the nations of the north every well regulated village aspiring to any degree of respectability has its public or town house, which among the Eskimos is called the *casine* or *kashim*. It consists of one large subterranean room, better built than the common dwellings, and occupying a central position, where the people

congregate on feast days." He says: "The *kashim* or public house of the Koniagas is built like their dwellings and is capable of accommodating 300 or 400 people." This, it appears, was without carving or ornamentation, a plain place of assembly, one which was large enough to accommodate all who might gather in it. It was used as a public workshop, where are manufactured boats, sledges and snow-shoes. Among the Aleuts a religious festival is held in December, at which all the women of the village assemble by moonlight. There is also a custom of representing in their dances myths and legends, and of acting out a chase, one assuming the part of a hunter and the other a bird, each trying to escape the snare. Among the Thlinkeets there is the custom of ornamenting their houses with heraldic symbols and allegorical and historical figures, while in front of their principal dwellings are carved figures representing the human face, crows, the heads of sea lions and bears. The Thlinkeets burned their dead, but the ashes are carefully collected in a box, covered with hieroglyphic figures and placed on four posts. The method of building their houses is very much the same among all these tribes. They have a summer and a winter house, the winter house being the most elaborate of the two. The common method of erecting this is to first dig a hole of the required dimensions to a depth of about six feet, erecting a frame upward two or three feet above the ground, and then placing a roof above. With the Eskimos the custom is to place a dome-shaped roof above the excavation. But of the Koniagas the custom was to dig a square space and to cover it with a square building, sufficiently large to accommodate three or four families. The habitation of the Fox Islands (Aleuts) consists of immense holes of one to three feet in length and from twenty to thirty feet wide covered with poles and earthed over, leaving several openings at the top, through which the ascent is made by ladders. The interior is partitioned off by stakes, and sometimes 200 or 300 people occupy one of these places. The Thlinkeets build substantial houses of planks or logs, sometimes of sufficient strength to serve as a fortress. They are six or eight feet in height, the base is in the form of a square; the roof of poles, placed at an angle of 45° , and covered with bark. The entrance is by a small side door. The fire is in the center of the room, but around the room are apartments or dens which are used as sweat-houses, store-houses and private family rooms. They exhibit considerable skill in carving and painting the fronts of their houses. Wherever they can find a place they paint or carve their crest and heraldic device of the beast or the bird designating the clan to which the owner belongs. There are two great divisions or clans among them—the wolf or the raven. But the raven is divided into sub-clans, called the sea lion, the owl and the salmon; the wolf into the bear, eagle, dolphin. See Fig. 2.

The Tinnehs or Athabascans generally dwell in villages and the people are called after the name of the region in which they dwell. Their winter houses or tenements are frequently made by opening a spot of earth to the depth of two feet, across which a ridge-pole is placed, supported at either end by posts. Poles are then laid from the sides of the excavation to the ridge-pole and covered with hay. A hole is left in the top for entrance and to let the smoke escape. Thus we see that a different method of constructing houses prevail with each one of these hyperborean tribes. The same is true in regard to their canoes; while there is a general resemblance to their house architecture,

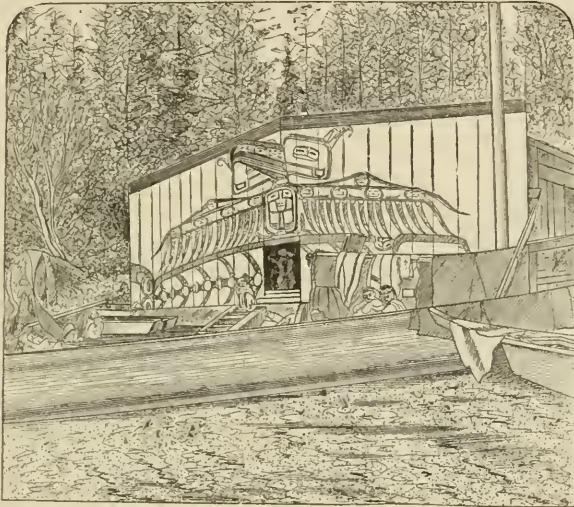


Fig. 2—A Thlinket House, with a Thunder Bird for a Totem.

yet each tribe had its own method of constructing a canoe, the Eskimo having one, the Thlinket another, the Athabaskan another style, each easily distinguished as peculiar to the tribe.

2. We take the Columbians next. These are divided into several tribes. First the Haidahs, Nootkas, Chinooks and Salish family. Here we find distinct architectural styles as well as distinct race qualities, the two corresponding in all places, the centers of population and the architectural centers being closely related. (1.) We begin with the Haidahs. Their permanent villages are especially built in strong natural positions, guarded by precipices, sometimes on rocks detached from the main land, but connected with it by a narrow platform. Their houses are built of logs or of split planks, frequently large enough to accommodate a number of families. Poole mentions a house which formed a cube of 50 feet, 10 feet of it being dug in the ground, which accommodated 700 Indians. Their houses are

nicely constructed and stand in a row, having large images in front cut out of wood, representing idols. Dwellings have all painted fronts, imitations of men and animals. The sacred houses of the Haidahs are often raised above the ground on a platform supported by posts, which were carved with human figures and painted red and black. McKenzie speaks of a large building in the center of a village, the center posts representing persons with their hands upon their knees, as if they supported the weight with pain and difficulty, the others, however, standing at ease with their hands upon their hips. The Haidah canoes are dug out of logs, sometimes 60 feet long, $6\frac{1}{2}$ wide, $4\frac{1}{2}$ deep, accommodating 100 men. The prow and stern are curved like a swan's neck, and with a monster's head at the extremity. With respect to carving and a faculty for imitation, the people are equal to the most ingenious of the Polynesian tribes, whom they resemble.

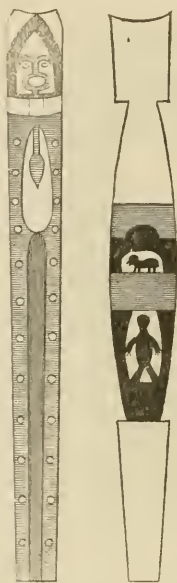


Fig. 3.

Fig. 4.

Totem Posts.

(2). The Nootkas choose strong positions for their towns and encampments. Each tribe had several villages in favorable locations for fishing at different seasons. The villages are sometimes built on detached rocks, with perpendicular sides, and provided on the seaside with projecting platforms resting on timbers projecting from crevices. These are reached by ascending the cliff on a bark rope ladder. The houses, when more than one is needed for a tribe, are placed with regularity along the streets. A row of large posts, from ten to fifteen feet high, grotesquely carved, supports an immense ridge pole, sometimes 100 feet long, with other rows on either side. The whole was covered with split cedar planks. A house like this, 40 by 100 feet, accommodates many families, each of which has its allotted space partitioned off like a double row of stalls, with a passage in the middle. In the center of each stall is a circle of stones for a fire-place, and around the walls are raised couches covered with mats. The Nootkas display considerable taste in ornamenting their houses and implements with sculpture and paintings, the chief effort being made in the supporting posts, which are called totems. Figs. 3 and 4. The sound Indians, such as the Clallams and Chehalis, have temporary huts for the poor and substantial houses for the rich. The houses measure over 100 feet in front and are divided into rooms, several fire-places in each dwelling, raised benches around the sides, and walls lined with matting.

(3). The Chinooks build dwellings of cedar planks, with corner

and central posts, the eaves being four or five feet high, but an equal depth excavated in the ground. Partitions of planks separate the apartments of the several families; the door is only large enough to admit the body. It was a favorite fancy of the natives to make this represent the mouth of a great head painted around it. In carving they are inferior to the Haidahs.

(4). The inland dwellings are often built sufficiently large to accommodate several families, each of which has its own fireplace, but no dividing partitions are ever used. Holes are left along the side for entrance and mats and skins placed on the ground for a floor and the skins serve for beds. The evidence of ethnic traits in these tribes is manifest in the architecture as well as in the language and mythology. The dwellings are arranged in small villages, generally located in winter on the banks of small streams, a little away from the main rivers.

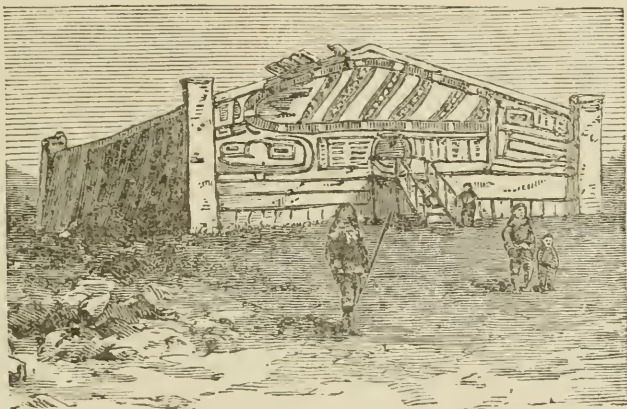


Fig. 5—A Haidah House.

We give a series of cuts here to represent the architecture of this region. It will be seen from these that totemism was a marked peculiarity—that this totemism embodied itself in their architecture. In one case the wings and head of a gigantic bird cover the entrance to the house, forming a sort of piazza in front of the house. See Fig. 2. In another case there is the figure of a whale and a fish carved in front of the building, the opening being through the body of the fish. See Fig. 5. This is a Haidah house. In the third case totemism embodies itself in the genealogical trees, carved pillars being placed in front of the houses, the houses themselves being left plain. See Fig. 6. There is a marked contrast between all of these houses and those of the Eskimos, pictures of which we have already given in previous numbers.

We give two figures to illustrate the manner of constructing the supporting posts in the Haidah houses. These have been

described by Rev. Mr. Eells. His description corresponds to that already given by Bancroft and others.

Thus we see that the architecture of this region varied with

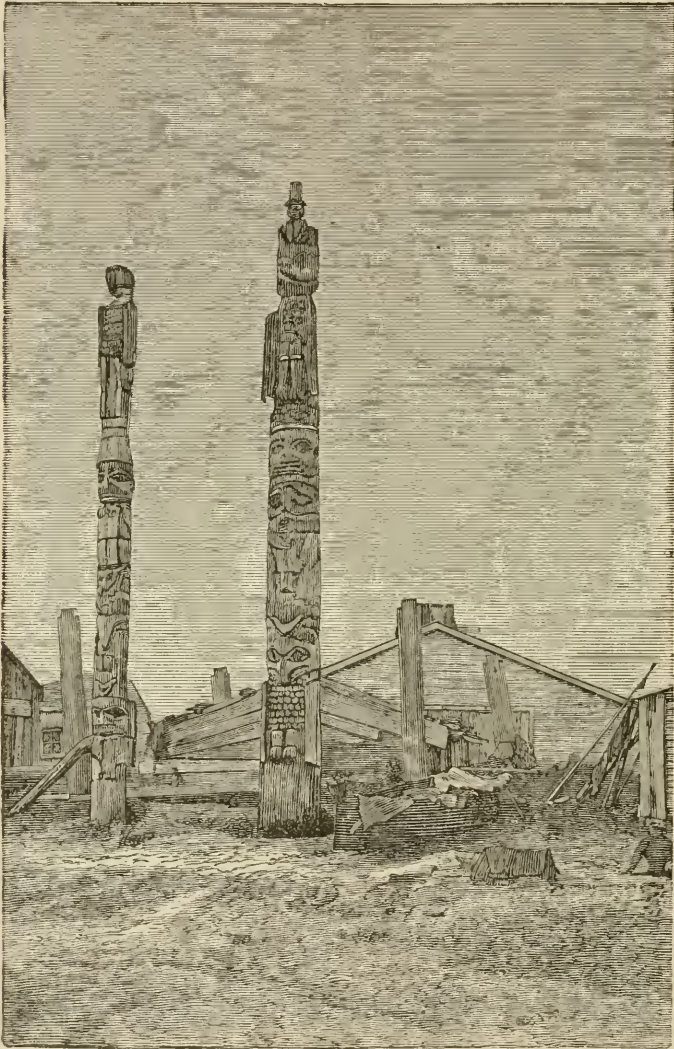


Fig. 6—Totem Posts.

the locality of the tribe, each tribe having a style peculiar to itself.

It would seem as if there were centers of population and architectural centers, and yet the houses, forts and other structures were characterized by styles of ornamentation and by

ways of symbolizing and methods of carving which were peculiar to the region. We do not know where the fashion came from, whether from Japan and the Polynesian Islands, or where, yet it was peculiar and strange.

Here we quote from Dr. Franz Boaz, who says: "The civilization of Northwestern America is not uniform. Three centers may be distinguished, which agree fairly with the linguistic divisions. The totemism of these groups, their mythologies, their social organization and their tribal customs differ. An alleged similarity of Asiatic and northwest coast culture could not be recognized by him on this account. A similarity of the Kwakiutl, Salish and Tsimshian elements is out of the question. It is necessary to study the Haida element, and it may be that there a connection exists."

3. The Californians come next. These are divided by Bancroft into four classes—northern, central, southern and eastern, the first embracing the Klamaths, Modocs and Shastas, the second embracing the Tulares, the Yosemite, the Russia-river and many other insignificant tribes; the third embracing the tribes about Los Angeles and San Buenventura, but the last embracing the Shoshones, Bannocks, the Utes, the Pah-Utes, the Washoes, and others. The California Indians as a general thing present a very regraded aspect; in fact may be regarded as about as low a grade of humanity as is found in the continent. Architecture would prove this even if there was no other evidence. "The habitation of the Klamath Indians is built in the following manner: a circular hole five feet in depth and varying in diameter is dug in the ground. Around this pit stout poles are sunk, which are drawn together at the top until they nearly meet. The hole is covered with earth. The dwellings built by the Hualpas are a little better. The inside of the cellar is walled up with stone, and at a distance of a few feet from it another stone wall is built on the surface. Heavy beams or logs are leaned up across this, meeting at the top." The position of the door varies, being sometimes on the roof, sometimes on the level, and sometimes high up in the gable. But the slope and dimensions of the door never vary. It is always circular, barely large enough to admit a full-grown man." "The house is the abode of a family. Each head of a family governs his own domestic circle as he thinks best, but there is a head man to each village and sometimes a chief to each tribe." The great institution of the northern Californians is the *temescal*, or 'sweat house,' which consists of a hole dug in the ground and roofed over in such a manner as to render it almost air-tight. It serves not only as a bath and medicine room, but also as a general rendezvous for the male drones of the village."

The central Californians are still more degraded than the northern. Their dwellings are as primitive as their dress. In summer all they require is to be shaded from the sun, and

for this a pile of bushes or a tree will suffice. The winter huts are sometimes excavated three or four feet below the ground and consists of willow poles with tops drawn together, forming a conical structure, or with the upper ends drawn over and driven into the earth, so as to give a semi-globular shape. Each hut generally shelters a whole family of relatives, so that the dimensions of the habitation depends upon the size of the family. Thatched, oblong houses are occasionally met with in the Russia north valley in the form of a letter "L." In the center the different families of relations had their fires, while they slept next to the walls. The habitation of the people of Nevada and the greater part of Utah are very primitive and consist of heaps of brush, under which they crawl, or even a mere shelter of bushes, semi-circular in shape, roofless and three or four feet high. The Snakes or Shoshones build better dwellings than the Utes, and yet these are very primitive. Long poles are leaned against each other in a circle and are then covered with skins, forming a conical tent.

We see, then, that the Californians, while they were divided into different tribes, were—owing to their degraded position—scarcely separable from one another. There was certainly no differentiation in their architecture for their dwellings, their religious houses, their defences were all comprised in one, and that the rudest kind of a hut, and the tribes were only distinguishable by their excess of filth and squalidness and degradation.

4. The New Mexicans come next. These present an entirely different aspect from the Californians. Here we come upon the Apaches, Pimas, the Navajos, the Moquis and the Pueblo families. We shall, however, speak of them under another head, and therefore omit a description of their architecture.

5. The wild tribes of Mexico and Central America follow next. These included the Quinames, the Olmecs, the Otomis, the Huastecs, the Miztecs. These, however, were once civilized races and we shall treat them under that head. Our view of the wild tribes will therefore cease with the mere mention. Enough has been said concerning their architecture to convince us that it was, to a certain degree at least, affected by ethnic tastes and customs, though the social status and modes of life may have had much to do with it.

II. We next take up the monuments found in the Mississippi valley. We are now brought into the region of the Mound-builders. These are strictly prehistoric, and yet their monuments are left for us to study. The position which we take is that the mounds and earth-works give evidence of a similarity of tastes. This similarity is exhibited by the tokens contained in burial mounds and by the earth-works themselves. We find in the same region a great diversity of structures, and are com-

pelled to ascribe them to different dates and to different styles.

Here we would call attention to the contrast between the architecture of the southern tribes and that of the northern tribes. These tribes have been considered as belonging to the same race and as occupying the same social status, manifesting the same stage of progress, but when we study their architecture we find a great contrast, for it resembles that of the civilized tribes of the southwest far more than that of the uncivilized tribes of the northeast, showing that it had been borrowed from or had been influenced by the people of the southwest, and had perpetuated that influence for many generations.



THE CONICAL HOUSE OF THE WICHITAS.

The following were the methods of constructing and ornamenting houses among the northern tribes :

The Dakotas constructed theirs in the form of conical tents, out of poles, covered them with buffalo skins, and ornamented the sides with the clan-totems or with the dream-gods or some other figures suggestive of their mythology.

The Comanches constructed theirs out of poles, but thatched the outside with reeds and grass, in such a shape that they resembled so many stacks of hay.

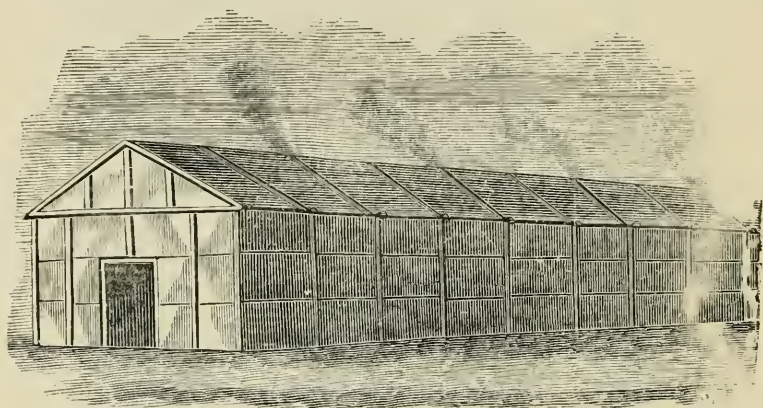
The Mandans constructed theirs out of heavy posts with

cross timbers, and covered the whole with sod and placed their totem poles in front of the houses.

The Ojibwas constructed theirs out of poles and bark but in an oblong shape, with the ends upright and a door at each end. The Iroquois built theirs also with a frame work of poles and a covering of bark in an oblong shape, but with a long passage way running lengthwise of the hut, and places for different fires in the passageway. The interior was divided into apartments for the different families. (See cut.)

The Powhattans built theirs in about the same way as the Iroquois, but the Seminoles constructed theirs put of posts which were set upright in the ground and placed in a circular shape, with a conical roof made out of rafters which were thatched with reeds and grasses.

These northern tribes made no distinction between the houses of the chiefs and those of the common people, for they

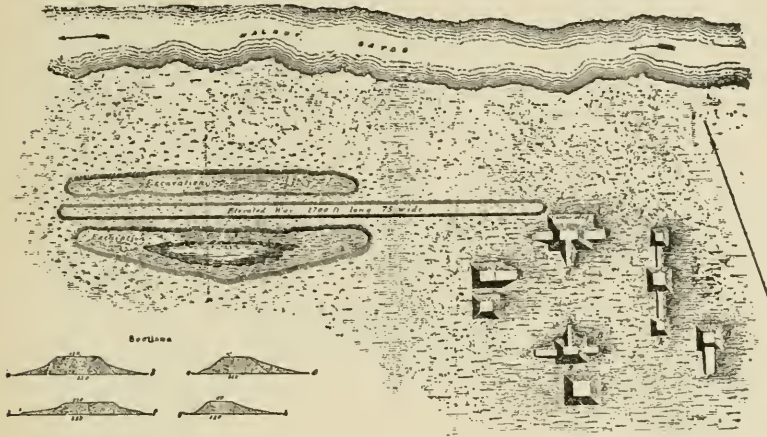


LONG HOUSE OF THE IROQUOIS.

were all of the same style and appearance, and were on a common level and were generally placed in a circle about an open area, sometimes with a stockade around them to protect the village. The only structures which were separate from the villages were the forts on the hill or the burial places near by.

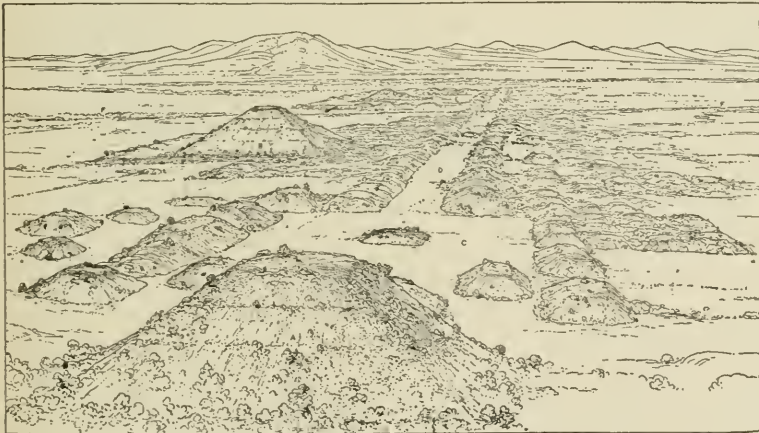
When, however, we come to the Southern Indians of the Muskogee stock, such as the Creeks, Cherokees, Choctaws and Chickasaws, we find an entirely different system. These tribes dwelt in villages, but they were villages which resembled in a rude way the cities which were occupied by the Aztecs, Toltecs and various tribes of Central America. Among the points of resemblance, the most important one is, that the ruling classes and officials, such as the chiefs and their families, lived sepa-

rate from the common people and built their houses on the summits of the pyramids. The priests, or medicine men, also had their temples or rotundas upon the summit of conical



ANCIENT VILLAGE SITE AT WALNUT BAYOU.

mounds, the rotunda being used also for councils as well as for religious assemblies. Another peculiarity was that their so-called *dead houses*, or houses in which the bodies of the dead



ANCIENT TOLTEC CITY AT TEOTIHUACAN.

were placed, were full of treasures and contained many carved images which stood in a threatening attitude and were objects of terror to the common people. Still another point of resemblance was, that the ceremony of reproducing the sacred fire

was practiced among these people—a ceremony which resembled that which occurred among the Aztecs once in every fifty years, at which time there were many human sacrifices, and the fire was reproduced by whirling the fire generator upon the body of a human victim. This strange ceremony involved the breaking of old pottery vessels and the cleansing of the houses, the use of new vessels, as well as the distribution of fire from the central altar to the fireplaces of the entire people,

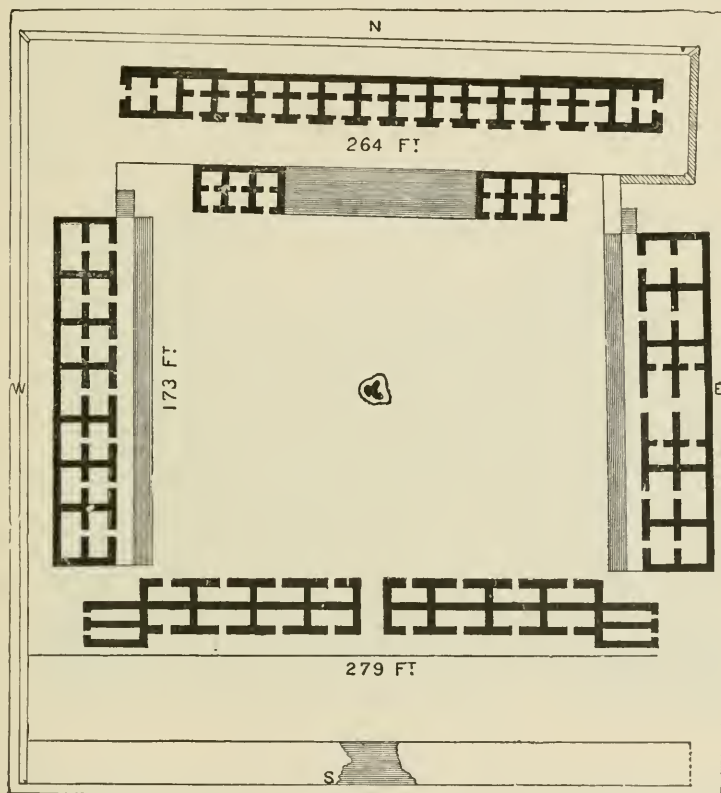
The most interesting point of resemblance between the architecture of the Muskogees and of the Aztecs and Toltecs, is found in the temples or so-called rotundas, or places of assembly. The rotundas of the southern tribes were, to be sure, constructed out of wood and were rude in their appearance,, and yet when we come to consider their shape and general style of construction, the symbolism which was embodied in their ornaments, carved figures, also the general arrangement of the different parts and the use of them, especially in connection with religious ceremonies, we shall find many very striking analogies.

These rude and primitive temples, which were called rotundas, with their covering of bark and their circle of seats or sofas on which the inmates lounged, with the fire in the center, were indeed very inferior to the massive stone structures which were wrought with such care and contained so many religious symbols, and yet we may perceive a resemblance between every part, for both represented apparently the great temple of the universe with its circular horizon and the dome of the sky surmounting it, the sacred fire being in the center beneath the dome and the lightnings playing in the form of serpents between the earth and sky, while the sun with its changes shone in from the four quarters. The symbolism which is contained in these great houses and rotundas of the Southern Indians is certainly very significant, especially considering the fact that they so closely resembled that which prevailed among the so-called civilized people of Mexico and Central America, for it shows that they had contact with one another and may have belonged to the same stock, and originally migrated from the same center. There was, to be sure, as we have said, a variation in the style of building between these tribes, but it was a variation which was more noticeable in the houses of the common people than in the houses of the rulers or in the rotundas. Bartram describes these as being the same among the Cherokees, Choctaws and Chickasaws.

The feature which furnishes the most striking resemblance between the works of the southern Indians and those of the Mexican tribes, and at the same time shows the greatest contrast to the earthworks of the northern Indians, is the pyramid. The shape of the pyramids may be seen by examining the cuts,

one of which represents the pyramidal mounds which still stand at Walnut Bayou, near the Mississippi River; and the other, the series of pyramids which are still found at Teotihuacan, in Mexico.

The pyramidal mounds mark the site of an ancient village of the southern mound builders, a village in which the houses of the chiefs were placed above those of the common people, all of them arranged in a quadrangular form, but with stair-

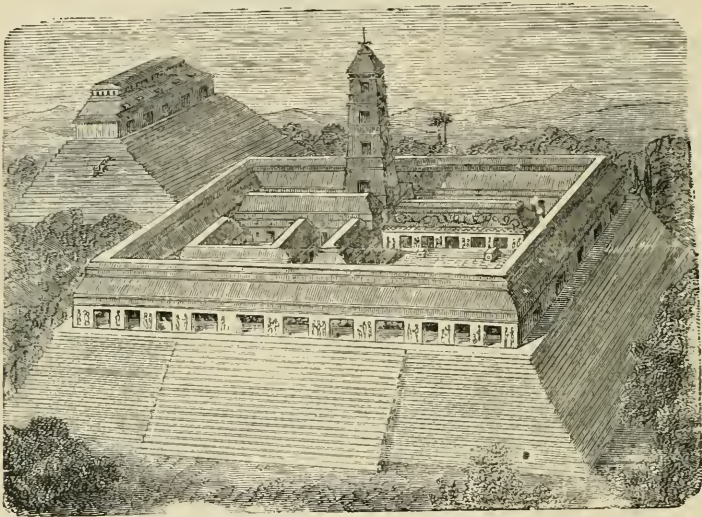


GROUND PLAN OF THE NUNNERY AT COPAN.

ways leading from them to the open area in the center, while a long wall stretches away from the group on the side of the stream or bayou, thus furnishing a landing place for the people in time of high water. The truncated pyramids at Teotihuacan, on the other hand, mark the site of an ancient, prehistoric city, which was situated in a great plain. The houses of the upper classes in this city, however, were arranged as were those

of the village. They were all placed on the summit of the pyramids, but in quadrangles, all of them fronting the courts, which were enclosed, while a wide road, called the "Pathway of the Dead, led from the central temple to the gateway in the distance. The contrast between the village of the mound builders and the city of the pyramid builders seems to be great, yet the foundations on which the two widely separated peoples placed their temples and the houses of the ruling classes are very similar.

This resemblance between the works of the southern mound builders and of the pyramid builders of the southwest, can hardly be accounted for on the ground of ethnic relationship, inasmuch as the people at present speak different languages. Still there are traditions among the Muskogees to the effect that their ancestors migrated from the west and southwest,

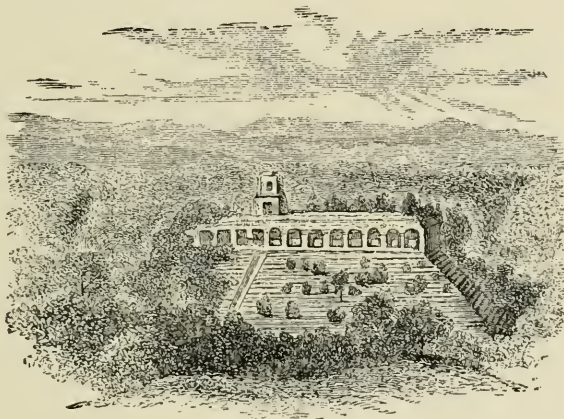


THE PALACE AT PALENQUE.

from the mountain of fire, and entered the region of the Gulf States many generations ago. That there was a resemblance in the arrangement of the apartments of the great house of the Muskogees and the apartments of the palace of the Mayas, may be seen from the cuts, which represent the ground plan of the palace called the Nunnery, at Uxmal, and the restoration of the palace of Palenque. Bancroft has described the Nunnery as follows:

"This is perhaps the most wonderful edifice or collection of edifices in Yucatan, if not the finest specimen of aboriginal sculpture and architecture in America. The supporting mound is, in general terms, 350 feet

square and 19 feet high, its sides very nearly facing the cardinal points. The southern or front slope of the mound is about 70 feet wide and rises in three grades or terraces. There are some traces of a wide central stairway leading up to the second terrace. On the platform stand four of the typical Yucatan edifices, bnilt around a courtyard with openings between them and the corners. The southern building is 279 feet long, 28 feet wide, and 18 feet high. The northern, 264 feet long, 28 feet wide and 25 feet high. The eastern, 158x35 feet, and 22 feet high. The western, 173 feet long, 35 feet wide and 20 feet high. The situation of the four structures forming the quadrangle and the division of each into apartments, is shown in the accompanying plan. Each of the four buildings is divided longitudinally into parallel ranges of apartments, arranged very much like those of the governor's house, with doorways opening on the interior court. They all present the same general features of construction—angular arched ceilings, stone rings on the inside of the doorways for curtains, holes in the sloping ceilings for hammock timbers, and an entire absence of openings except the doors. The sides and ends of each building are plain and unplastered below the cornice; above the cornice the whole surface—over 24,000 square feet for the four buildings—is covered with elegant and elaborate sculptured decorations. The four interior facades fronting on the court are pronounced by all beholders the *chef de-œuvres* of the aboriginal decorative art of America, being more chaste and artistic and less complicated and grotesque than any other fronts in Yucatan."



TOWER AT PALENQUE.

There are two noticeable features which have not been mentioned. Over the doorways of the southern court facades there is a representation of an aboriginal hut with the statue of the divinity seated within the hut, and a strange outre looking ornament, called the "Manitou face," above the hut, the diamond lattice-work and vertical columns being sculptured in stone on either side of the hut. This hut, taken in connection with the general arrangement of the apartments and the resemblance to the rude wooden buildings described by Bartram as belonging to the great houses of the Muscogees, convinces us that the

beginnings of the architecture of the two regions were not far apart.

The same lesson may be drawn from the view of the palace of Palenque, though this palace was much more elaborate in its style of construction and general finish than anything found in the Mississippi valley. Its broad stairways, its many halls and courts, the curved surface of the roofs, the height of the tower, the truncated pyramid supporting it, the apartments or galleries with walls of stone, the corridors which surround the apartments and affording communication to the interior, the sculptured figures on the front of the corridors and the facades of the palaces, are all in strong contrast with the rude wooden apartments which constituted the chief features of the great house, and yet the general arrangement of the buildings and the use made of the apartments are so similar as to suggest the same customs, habits and social organizations.

This is the point which is impressed upon us by the study of these rude structures which formerly abounded in the Gulf States, as compared with those which were discovered by the Spanish conquerors in Mexico and Central America. We see in them the stages through which the architecture of the New World struggled, the very beginnings being presented by the uncivilized but sedentary tribes, the highest aims and triumphs being presented in the works of the more civilized races.

The shape of the "great houses" and the arrangement of these houses around a square court, was the same among the tribes of the Gulf coast as among the Aztecs and other tribes of Mexico. The "great houses" among the latter are often called "palaces." They were very elaborate and striking in their sculptured ornamentation and in the massive cornices and lofty combs which arose above the roof. They were constructed of stone and are full of all manner of sculpture. They are approached by wide stairways, which are also lined with sculptured figures, yet so great is the similarity between them and the so-called "great houses" of the southern tribes that we naturally go to these to learn what were the early stages of this style of architecture. Bartram says:

"The great or public square generally stands alone in the center or highest part of the town. It consists of four square or cubical buildings of one story in height, of the same dimensions, and so situated as to form an exact tetragon. There is a passage at each corner, of equal width. Each building is constructed of a wooden frame fixed strongly in the earth and neatly plastered with clay mortar. One of these buildings is properly the council house, where the Mico, chiefs and warriors, with the citizens, assemble every day in council to hear, decide and rectify all grievances, complaints and contentions, give audience to ambassadors and strangers and hear news from distant towns, allies, or distant nations. This building is different from the other three, as a partition wall longitudinally placed from end to end divides it into two apartments, the back apartment totally dark,

making a secluded place, designed as a sanctuary, dedicated to religion or priestcraft. Here are deposited all the sacred things, as the medicine pot, rattles, deers' hoofs, calumet or peace pipe, the imperial standard, made of the feathers of the white eagle's tail, curiously formed and displayed like an open fan on a staff, painted or tinged with vermillion in the time of war.

The other three buildings which compose the square are furnished with three ranges of cabins or sofas, and serve as a banqueting house and shelter, to accommodate the audience and spectators at all times, particularly at feasts or public entertainments, where all classes of citizens resort day and night in the summer or moderate season."

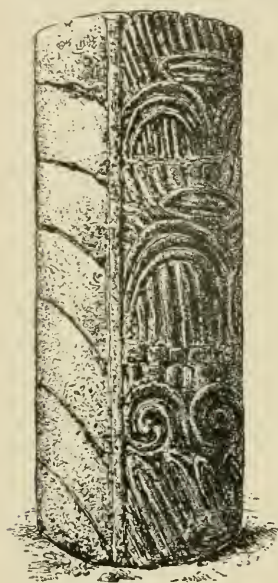
"The pillars and walls of the houses of the square are decorated with various paintings and sculptures, which I suppose to be hieroglyphic, and an historic legendary of political and sacerdotal affairs, but they were extremely picturesque as caricatures: as men in a variety of attitudes, some ludicrous enough, others having the head of some kind of animal, as those of a duck, turkey, bear, fox, wolf, buck, etc.; and again, other creatures are represented having the human head. These designs are not ill executed. The pillars supporting the front or piazza of the council house of the square, are ingeniously carved in the likeness of vast speckled serpents ascending upwards."

The similarity between the house construction and ornamentation of the southern tribes and that of the tribes in Mexico and Central America is noticeable but is difficult to account for, except on the supposition that there was a contract between the two people and that the same general system of government and distinction of classes existed in the two regions. We present here two cuts representing columns at Tulan in Mexico and at Chicheu-Itsa-Guatemuala. The first was a simple shaft ornamented with feathers, the base representing a serpent's head. The second has a capitol which is ornamented with human figures but supports an entablature and heavy cornice. These present the same conception which was recognized by Bartram in the houses of the Muskogees, especially those which were occupied by the ruling classes. They show how the ethnic style of one country was introduced into another, but upon the whole, confirm the position taken.

This custom of placing the houses of the ruling classes on the summit of truncated pyramids, and around public square or courts, is distinctive of a state of society in which the many are controlled by a few. Such a state does not often exist among the hunters and savages, but generally appears among the agriculturists; though, on the northwest coast, the fishermen who were gathered in permanent villages, exhibit these different grades and ranks. The Southern or Muskogee tribes were the earliest, or the most primitive, to show this condition, but the tribes of the southwest carried it to great extremes.

III. Another illustration of the prevalence of ethnic styles can be found in the various structures which formerly existed on the great plateau of the west, where the form of house construction is entirely different from that found anywhere else, and where also the style of house ornamentation is in the greatest contrast. This was, as every one knows, the home

of the Pueblos and the Cliff-Dwellers, but it is also a locality where a peculiar ethnic type of architecture is to be seen. The question is, How did this arise? Was it owing to the influence of environment, or did it arise from the social organization, combined with the mythology which had been inherited from an unknown ancestry. These people have long dwelt in the arid regions of the west, isolated and separated from the rest of the world, but they have developed in their isolation a mode of construction which is peculiar to the region, and totally unknown anywhere else in the world. They do not present any very high stage of architecture, nor any very advanced stage of art, but their method of constructing their houses and their style of decorating their interiors as well as their



SNAKE COLUMN.



COLUMN AT CHICHEN-ITZA.

style of ornamenting their pottery and works of art, are very unique.

The snake dances of the Moquis, the sand paintings of the Navajos, and the house decoration and personal ornamentation of the Zunis, are well known, still there were so many architectural features contained in those ruined villages, which constituted the abodes of the strange people called Cliff-dwellers, that there is a demand for a close study of their works. In the cliffs there were towers for defense; estufas for religious assemblies; many storied houses for the dwelling places of the people; balconies for their loitering place; behind the houses were courts in which the children might play, and open places where

pottery was manufactured and where looms were set up; and farther back, under the cliffs, was the burying place for their dead, while hidden away in the niches of the rocks were the storehouses where they placed their grain; and above all were the loophole forts, from which the warriors shot their arrows into the bands of wild Indians, who were lurking in the valleys, and were constantly attacking them in their chosen places of refuge. When we consider all the dangers, and the difficulties with which they contended, we conclude that they did not fall far short of many of the cultivated races of the earth, even in the departments of art and architecture. It is especially worthy of notice, that all the buildings which have been discovered,



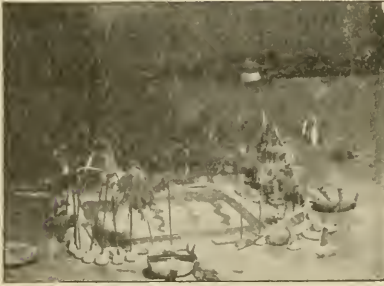
CLIFF PALACE AT MANCOS CANON.*

whether in the high mesas and open places of the Pueblo country, or in the deep cañons and remote recesses in which the Cliff-dwellers made their refuge, that there was one particular type, or style, which they wrought out for themselves, without aid or suggestion from any source, except that which came from the study of their natural surroundings and the exercise of their own powers. It seems certain, to us, that if any people deserve the credit for having developed an ethnic type of architecture and art, these comparatively uncultured and strange people, whom we call the Cliff-dwellers, are the most deserving.

There is very little ornamentation to be seen in the buildings of the Cliff-dwellers or Pueblos. A simple dado around the inner rooms, and the use of different colored plaster, constituted about all of the ornamentation that was used. When, however, we come to the religious ceremonies and observan-

* The Cliff Palace contained a tower for defense at one end, estufas in the middle, a line of three-story houses in the front, and an open court in the rear, the whole overshadowed by the shelving rock but protected by the steep cliff below.

ces, we find an immense amount of ornamentation; all of it grotesque, outre and bizarre. So whimsical is the costume of



A PUEBLO ALTAR.

—Dr. Washington Matthews, Mr. F. H. Cushing, J. Walter Fewkes, and others.

Dr. Fewkes classifies the altars under two groups: those arranged on the floor of the kiva, and those forming the uprights of a vertical frame-work. The former include the following objects: tiponis, effigies or idols, and medicine bowls. The tiponis are the badges of the religious fraternities, and constitute the "palladium" of the clan. They are totemic in character, but also contain symbols of food, and of seed, which constitute the sustenance of the agricultural people. Generally, an ear of corn, with appropriate wrappings and feathers, is very conspicuous. The idols represent the sky and earth gods, and are male and female. Every clan had a great sky-god, and an earth-god or goddess, the former being the father, and the latter the mother of all the minor gods. The medicine bowl and other objects, are generally placed in front of the altar, on a low pile of sand, upon which are drawn six or eight lines of sacred meal, representing the six directions. On each of these lines of meal is an ear of corn, of the color cor-

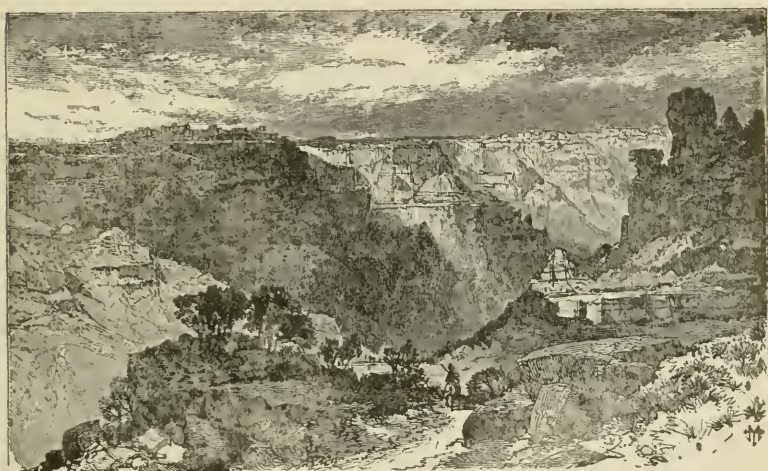


MASKED DANCERS.

FOOTNOTE.—Lieut. Simpson has described, in his report, the painting upon the walls of an *estufa*, at Jemez, and gave three or four plates. In one of these there are two deer, gracefully depicted, painted in blue; in another, there are several birds painted in blue and brown, while shields are painted in red, green and white. In another, a large squash-vine is painted in blue, with a dark back ground; and, in another, there are several foxes painted in blue, two or three deer painted in red and white, all against a dark back ground.—See REPORTS OF SEC. OF WAR, July 24th, 1850.

responding to the directions or points of the compass—north, yellow; west, blue or green; south, red; east, white; above, black; below, speckled. Alternating with these ears of corn, are effigies of birds and butterflies, also painted with different colors—yellow, blue, red, white, black, variegated. A very common symbol is the one which represents the rain-cloud (Omawuh), an arch symbolizing the cloud; perpendicular lines representing the falling rain; zigzag markings representing the lightning

There are often paintings and engravings upon the rocks, which show the artistic taste of the Cliff-dwellers. In these paintings, the figure of a hand is very conspicuous. Some of their house paintings contain the traditions, and an account of



VIEW OF MOQUI PUEBLOS.

the wanderings of the people, and furnish legendary evidence of the combination of several tribes in one great village. They furnish the only clue to the history.

The work upon "The Cliff-Dwellers," which has already been published, illustrates this point, and it does not need to be dwelt upon here; but there are a few facts which should be brought out, and set in a new light. It is acknowledged by all, that the pattern which was adopted by the Pueblos in building their "great houses," was borrowed from the shape of the mesas on which they built them; the terraces with which they abounded, being close imitations of the terraces which were seen in the cliffs. It is also acknowledged that the pattern which the cliff-dwellers followed in constructing their kivas, or religious assembly places, they took from the primitive hut

which constituted their primeval abode. This hut was evidently constructed out of wood, and was supported by posts; and was entered from the top, just as the huts of the California Indians are today. But along with this primeval pattern, there were introduced elements which, to them, became the symbols of the great house, whose roof consisted of the dome of the sky, whose floor was the surface of the earth, and whose supports or posts consisted of the six great pillars which their mythology taught them, were the supports of the sky. Still further, they made the opening in the floor of the kivas, which they called the "sipapuh," to represent the "place of emergence," through which their ancestors, according to their inherited mythology, came up through the different caves in which they had formerly dwelt. The roof of the cave was symbolized by the roof of the kiva; the sides of the cave, by the walls



SCENERY IN THE PUEBLO REGION.

of the kivas; and the opening through which they reached the upper surface, by the "sipapuh" in the floor of the kiva. We have, then, a double symbolism in this simple structure which was used as the assembly place of the secret societies, and the council house of the clan chiefs, as well as the sleeping place for the men of the entire village, the world above

and the world below being both symbolized.

There was a grandeur in the scenery about them, and an influence coming to them, from the shadowy cliffs below, which evidently impressed their senses and filled their souls with a reverence for the unseen divinities. One cannot look upon these many storied houses, kivas and courts, built upon the ledge of the rock, and covered with the overhanging cliff which formed the only roof of the houses, without thinking of the shadow of fear which constantly haunted them, and realizing that they were, after all, like fugitives who were fleeing from a cruel and relentless enemy.

The ethnic style was drawn from the cliffs and mesas, but the form of construction was gained from their necessities as well as from the unconscious influence of the surroundings. The architecture of the Pueblos and Cliff-Dwellers is very instructive in this respect; it shows that the material which was used was owing to the abundance of stone; the manner of constructing their houses and terraces was copied after the cliffs:

and mesas; the manner of arranging the houses and rooms was such that a dead wall would always be presented to those who, whether friendly or hostile, approached the village; but the manner of the arranging of the rooms of the houses, one above the other, placing the storerooms in the lower stories and the rooms of the chiefs on the upper stories, was owing to the communistic system which prevailed among them. The originality of this style of architecture came, in reality, from the teachings of nature combined with a unique system of society which prevailed among them. There may be certain analogies between these so-called communistic houses, which were built after the honeycomb pattern, to the so-called palaces which prevailed among the nations of the southwest, in Mexico and Central America; but the differences are so many more than the resemblances, that we are forced to believe that there could have been no connection between them when they were first erected, and no borrowing from one another at any time. The ethnic type was one which originated in the very locality in which it appears.

These Pueblos, when seen from a distance, on the summit of the mesas, appear like ancient castles, but as we come nearer we find that they are not castles at all, for there are no iron-bound gates, no grated windows, and no dark passages, which suggest tragic stories or romantic adventures; and yet they are castles, for they were, at one time, the places of refuge to a people who were constantly beset by enemies, and who had to protect themselves from the midnight attacks of the foe who lurked in the shadows of the forest, or in the secret places among the rocks. Inside of these castles the scene was very peaceful, for here dwelt the different clans and families of a tribe, the families having all things in common, and sharing the different apartments; the village cacique, who occupied the upper apartment, being like a father to the household; and the village officers, who superintended the work and directed the employments, being like elder brothers of the family.

This pueblo territory, which was fringed on its borders by the strange abodes of the Cliff-dwellers, presents, as we have said, a very peculiar form of house construction, and a peculiar style of ornamentation. But there were districts surrounding it, in which we find a style of constructing houses very different in all its features, the difference being due to the ethnic taste of a people who belonged to another stock, or race. We have not the space here to dwell upon these differences, and shall only refer to the few illustrations which are furnished herewith. It will be noticed that, upon the Gila River, which flows around the southern and western borders of the Pueblo territory, there are certain great structures, in rectangular forms, which resemble massive temples more than they do fortresses, though they are called castles. Another distinct type is also presented, in

the province of Sonora, the first having received from the Spanish the name of Casa Grande, the other the name of Casas Grandes, the singular and the plural, suggesting the main difference between them. Still farther south, amid the mountains of Sonora, are deep valleys, on the sides of which are hidden a number of houses, which are quite different from those before described. The style of the storehouses and the shape of the abodes present features which are not seen anywhere else.



TOLTEC ALTAR AT TEOTIHUACAN.

IV. The best illustrations of the ethnic types of architecture, are found among the so-called civilized races of the southwest. These races were divided, as every one knows, into two or three great stocks, of which the Nahuas and Mayas are the chief, though the Aztecs and Toltecs are among the latest representatives. The general opinion is, that there were only two styles of architecture to be found in this entire region—one of them represented by the various cities of Mexico; the other,



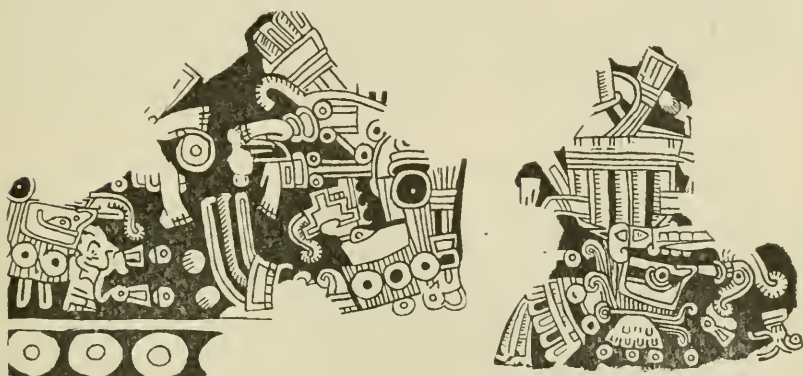
TOLTEC COSTUMES.

by the cities farther south, in Yucatan, Guatemala and Honduras; but recent explorations are showing that there was here a great variety in the method of construction, as well as in styles of ornamentation, as each tribe, or collection of tribes, had a style peculiar to itself, exactly as did those on the northwest coast, and in the Mississippi valley. This will be seen by comparing the ruins at Xochicalco, near the City of Mexico, with those at Mitla; and again, by comparing those at Mitla with the ruins at Papantla and Mayapan, all of them situated in provinces of Mexico. And these, in turn, should be compared with the ruins at Palenque, Uxmal and Chichen-Itza, which were cities situated in Honduras and Guatemala. There are also ruined cities in Yucatan, Salvador and Nicaragua, which differ from all the others before mentioned. Here, also, the strangest idols, and nondescript animal figures, are found north of that line.

Now, it is noticeable that among the Aztecs and other tribes of Mexico and Central America, there are many of those

mythologic figures which are made up of a variety of human faces and forms, mingled with figures of the serpent and other nondescript creatures, all of which are sculptured on the facades of the palaces, the statues of the kings and queens being placed in the courts in front of the palaces, with altars near them. The statues represented, not merely the form and features of the king or queen, but even the ornaments with which they were adorned while living, and various parts of the gorgeous apparel and headdresses which they wore, all boldly represented in the figures, which are carved with the utmost skill and accuracy into the stone pillars. The ornamentation of the facades and the portrait columns are also finished in the highest style of aboriginal art.

The ancient inhabitants of Mexico had methods of orna-

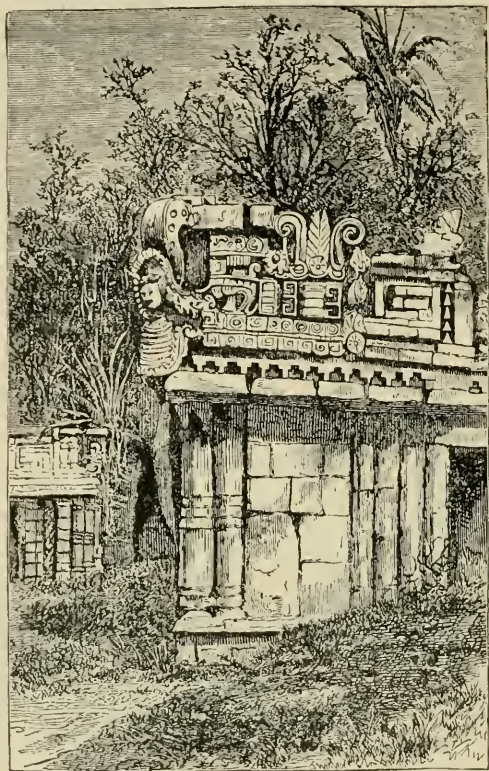


FIGURES PAINTED ON INTERIOR WALLS.

menting their houses which are worthy of study. There are many ancient ruins in this region, whose facades present a great variety of sculptured figures. Some of them present the shapes of serpents and nondescript animals, which were the products of their mythology. The ancient palace at Xochicalco, is especially noted for its sculptures. This has been described by various explorers, the latest being Mr. M. H. Saville. There are also ancient ruins at Teotihuacan, which contain houses with large and elaborate suites of apartments, all of them well built and highly ornamented. Prof. Starr has described one of these houses, as follows:

"The walls were covered with elaborate paintings, representing human beings, in fine garments and gorgeous headdresses. The colors used are green, red, pink, orange and brown. The most important figure may be seen in the cut; here we have a warrior, carrying a shield and weapons, terminating at the lower ends with balls, painted green; the shafts painted

green and pink; the shield, green and yellow; the right hand grasps a curious dagger, painted yellow, and held vertically. On the head the warrior wears large ear ornaments and a headdress, ending in a great crest of feathers, the central parts of which are painted green. The most elaborate paintings are on the southern wall of this room; two figures are represented, very similar in all respects. They face an altar which stands between them; the altar consists of a base in rose and red, with a streak of yellow; the upper part is an ornamental disc of pink, red, white and yellow, the whole design bordered at the sides with ornamental bands. Of the standing figures, the faces, hands and legs are painted yellow; the headdresses of feathers are large, and in white or pale pink. A great coil of yellow proceeds from the mouth of each, with nodes on the coils; these probably represented speech. On the left hand is clasped a pendant object, which may represent offerings, painted in pink, white and red."

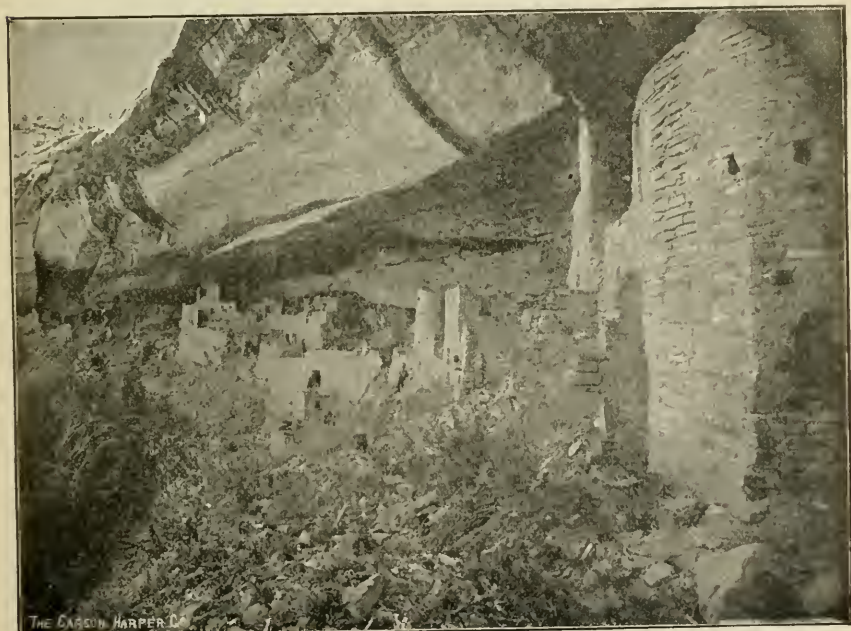


CORNER AT LABNA.

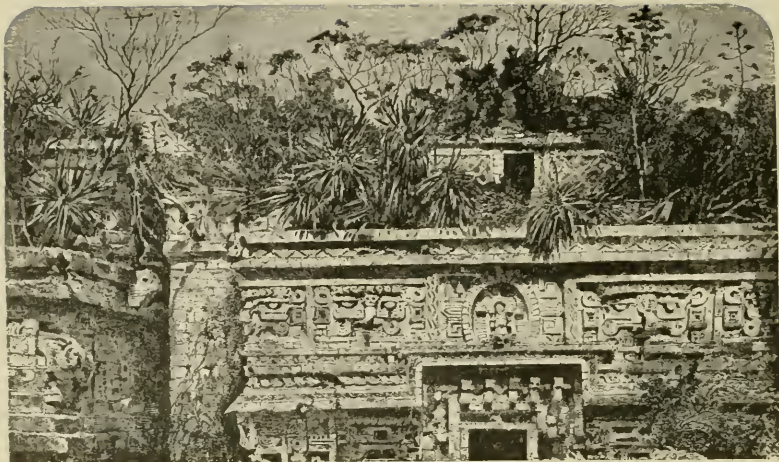
V. We see in these paintings a style of decoration which was common among the Toltecs, for they are found at Teotihuacan which is supposed to have been an ancient Toltec city. There was however another style which prevailed farther south in the region of Guatemala, Honduras and Yucatan and was common among all the Maya tribes. It consisted not so much in the decorating of the interior as in the ornamenting of the exteriors by sculptured figures in stone. Illustrations of the first are found in the ruined cities of Uxmal, Chichen-Itza, Kabah, Labna Zayi and of the latter mainly at Palenque. There are also in these cities many architectural features which are worthy of notice as nearly all of the buildings are finished with heavy cornices, wide entablatures, columns which are placed in clusters at the corners of the buildings, the sides of the doors, and often-times between the door-ways. The most of them are without capital or bases but are ornamented with



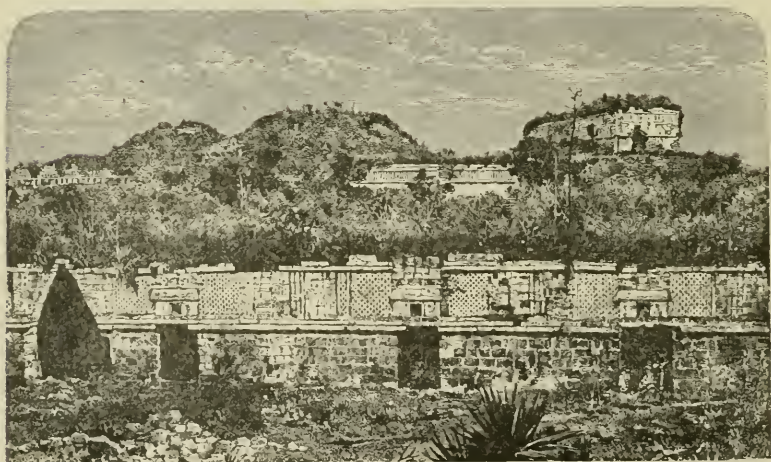
CLIFF DWELLINGS IN SONORA.



CLIFF PALACE IN MANCOS CANON, COLORADO.



FACADE OF THE NUNNERY AT CHICHEN-ITZA



GENERAL VIEW OF PALACES AT UXMAL.

bands at the centre and some of them with a sculptured base and top. These columns are found mainly in the palaces and form an interesting feature in the facades of these great buildings which were placed in a quadrangular form and sometimes placed on terraces which arose one above the other and were furnished with a high tower which made them appear very imposing.

The palaces also have their facades decorated with a complicated series of carving which are difficult to describe. The most singular object is that which has been called the elephant's trunk, though it more resembles an ornament which is common in Japan. Illustrations are numerous. Here, in



FACADE OF PALACE AT KABAH.

one place, at Chichen-Itza, a temple—with its front a mass of intricate carving, placed high upon a terraced mound—overlooked the entire collection of dwellings. Along each front of this high mound, extended the undulating body of a huge serpent, carved out of blocks of stone. High upon the platform of the temple rested the tail, while the gigantic head, with jaws wide open and

forked tongue extended, lay menacingly upon the level plain at the base of the mound. At one side, an immense terrace supported a massive structure, over three hundred feet long, of many turns and angles. It was a gigantic mosaic of marble and limestone. The rooms were narrow and windowless, but the entire front was covered with richly carved stonework,

—The difference between the decorations at Labna and Kabah are very marked. At Labna there is a serpent effigy, with open jaws and a human face in the jaws, projecting beyond the cornice, and forming a part of the characteristic hook, while behind the jaw, and above and below the serpent, are scrolls, palm leaves, Greek fret, rosettes, and other ornaments, while below the cornice are banded columns, and open doorways with pier and lintel. On the other hand, at Kabah there are fragments of the usual hooks, but the figures between them form a complicated network which resembles the pattern, which is often used in the drapery of the better classes, though the figures may have been designed for symbols.

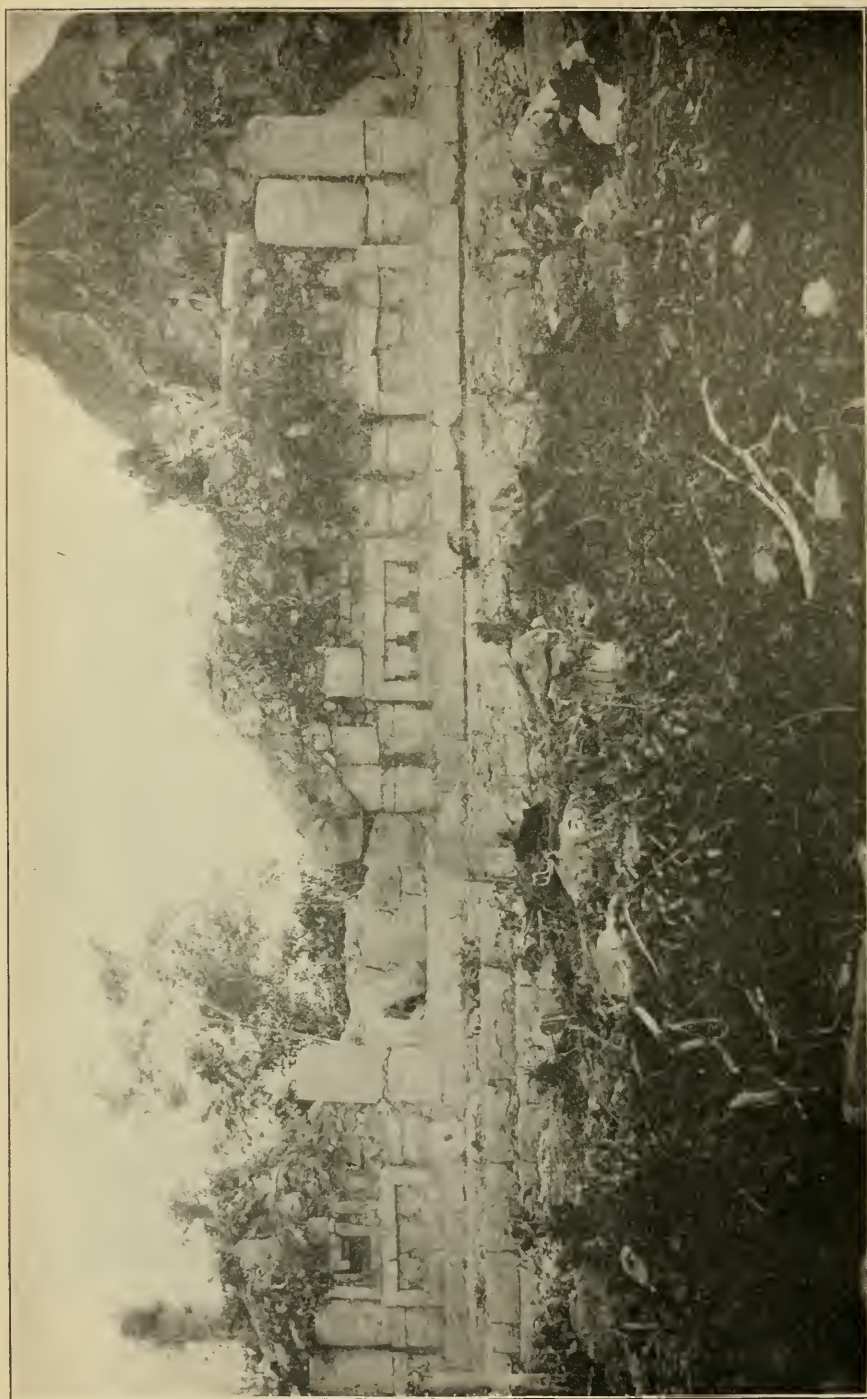
over which was placed a thin coat of hard stucco, glistening white and shining like silver, The flat roof was covered with the same material, and from the eaves projected gargoyles of grotesque type.

The hook at Kabah, extends out from the corner of the building, making a unique feature to the architectural decoration, and one that is characteristic of this region. There is also at Labna, in Yucatan, a mound forty-five feet high, which supports a building 20x30 feet, on which is a row of death's heads, two lines of human figures in high relief, an immense human figure, seated, also a ball or globe supported by a man kneeling on one knee, and by another man standing at its side. All the figures are painted in bright colors, and present the most curious and extraordinary appearance. Near by is a terrace 400 feet long and 150 feet wide, which supports a building of two receding stories, with a front of 282 feet. This front is elaborately sculptured, and presents three distinct styles in as many portions of the wall. At the corner is the open mouth of an alligator, from which looks out a human face; back of this corner are scrolls and palm leaves, and decorations resembling the *Roman key*; and below it, the series of columns clustered together, with bands around the center and at the bottom; the doorways were divided by a heavy column, with a square block for a capitol, with two lintels resting upon the block for support.

The palaces at Xkichmook, about fifty miles east of Campeche, have been explored by Edward H. Thompson, for the Field Columbian Museum. Of these, two of the edifices are represented in the plates, which have been kindly loaned. The palace appears to be the result of successive periods of growth; all of the chambers are finished in the usual style; the roof is vaulted with the Maya arch; there is a tower in the center, with a wide staircase in front of it; the cornice on the tower and on the palace proper, correspond in style. There are the remains of columns in the facade, and shorter columns in the entablature. Another palace, resembling this, has also many columns, but they are of a different type, and show a variation in style.



RUINED PALACE AT XKICHMOOK—THE NORTHWEST.



FACADE WITH COLUMNS, EDIFICE NO. 5, AT XKICHMOOK, YUCATAN.

CHAPTER XIV.

ARCHITECTURE OF CIVILIZED RACES OF AMERICA

MONUMENTS AND PYRAMIDS OF AMERICA COMPARED WITH THOSE OF THE OLD WORLD.

It is well known that the American continent contains the traces of a civilization which existed here long before the advent of the white man. What that civilization was and what its position in the ranks of the other civilizations of the world is an important question. It was the impression at the time of the discovery that there was, hidden away in the interior of this continent, a civilization which was quite equal to that which prevailed in most of the European countries. The ancient cities which were then discovered were compared to the cities of the eastern hemisphere. This impression was produced by the reports of the conquerors and by the testimony of the historians, and was not lessened as the conquests proceeded. It appears that new regions were opened before the conquerors and new cities were discovered, each city yielding an untold amount of gold and silver, and astonishing the people with the magnificent specimens of art and architecture which they presented. It was indeed a tale of wonder and one which excited the greatest surprise throughout the whole of Europe: first, Mexico, with its wonderful mountain lakes, its floating gardens, its streets and bridges, its magnificent palaces, its lofty pyramids and many temples; next, Yucatan, with its ancient cities, its tropical verdure, and its many and varied scenes; next, Peru, with its marvelous display of gold and other treasures, its populous villages, its paved, far-reaching roadways, its powerful system of government, its wonderful Inca dynasty. It was an era of romance and adventure. The world was ready to receive strange tidings, was glad to hear the tales of wonder which followed in close succession. The impression which was formed so early did not soon die away. The testimony of the historians seemed to confirm it, each new author adding to the story some marvelous feature. The impression has continued almost to the present day, and modern historians have thought to vie with the early writers in their descriptions of the magnificence which then prevailed. It was only during the present generation that any doubts arose as to

the truthfulness or accuracy of these accounts; but when they arose a literary reaction took place and many have been inclined to go to the opposite extreme. This tendency has also been increased by certain scientific writers, who have been disposed to look upon the accounts of the Spanish historians as altogether imaginative, and have endeavored to reduce everything to a plain matter-of-fact and ordinary condition, such as might correspond with their own theories of the civilizations of the continent. These writers have considered the populations of America to be all the same, calling them all Indians, and have reduced all the systems of government and all the conditions of society under one general class, which with its variations might be in accord with the communistic state and the clan life. Thus we have the two extremes. It will be our endeavor in this paper to so balance the probabilities and weigh the evidence as to decide which of these two classes of writers is the more correct, and to ascertain what the truth is concerning the ancient civilizations of this continent. While so doing we shall avoid the descriptions of the historians and the speculations of the scientific theorists, and shall seek evidence from an entirely different source: namely, the testimony of the monuments. It is well known that new monuments have been discovered and that the old monuments have been studied anew, and much additional testimony has been furnished, so that if there were no other reason than this, this of itself would be sufficient for us to go over the ground and take again the testimony of the monuments. So many explorations have occurred during the last thirty and forty years that we can not ignore them, but must take the descriptions which have been furnished by the explorers, and see whether they confirm or refute the testimony of the historians. The testimony which we shall specially examine will be that which comes under the department of which we are treating: namely, primitive architecture. We are to examine the prehistoric monuments to ascertain what their testimony is in reference to architecture. Is it the architecture of a civilized race which they present? If so, what is the position as compared with the architecture of other civilized races? If compared with that of the prehistoric and uncivilized, what rank or grade did it reach? With what age is it to be compared? What style does it represent? What are its peculiarities?

We turn then to the monuments for our evidence. The point which we make is that the monuments furnish a sure index of the civilization, for they not only show the position which was reached by the art and architecture, but also the grade of culture which was reached by the people. Our manner of treating the subject will be by comparison. We are to compare the prehistoric monuments of this country with those of the historic races of the Old World, but we are to take only those which belong to the civilizations of both countries. There is one thing notice-

able about the monuments of America: they overlap the early stages of the civilizations of historic lands, and they show after close examination exactly the stage or grade which was reached in this country during the prehistoric times.

We shall first take the monuments of all sections and races in America, comparing those of the civilized with those of the uncivilized races, with a view of ascertaining the difference between them. We shall next take the monuments of the civilized races in America and compare these with the works of the civilized races in the Old World, with the view of tracing the resemblances. Our main effort will be to show the position which the American civilization holds among the ancient civilizations of the world.

One point which we shall consider is that there was more difference between the types of civilization in America than some are inclined to admit. We are to remember that the American continent embraced peoples of very different grades and character. The Aztecs, Toltecs, Nahuas and Mayas were of a different stock from most of the northern tribes of Indians, although the name Indian has been applied to all. As to the source from which these different races or tribes may have come or the date at which they migrated we are not able to speak intelligently, for these are still involved in obscurity.

It is also worthy of note that there are as great differences in the architecture of America as in the Old World. We learn this from the study of the monuments here as well as there. The monuments of Europe, Asia and Africa all convince us that civilization developed in different lines, and embodied different ethnic qualities, so do the monuments of America. The development may not have been as marked nor did it reach as high a stage, yet so far as it did reach it convinces us that there were distinct lines. It is well known that the historic nations of the Old World all had an architecture of their own—an architecture which was marked by ethnic peculiarities, so we may say that the nations and races of America had. The nations of the Old World have given their names to their architecture; and we have the Chaldean, the Assyrian, the Egyptian, the Hellenic, the Etruscan and the Italian styles. The American nations have not given any name, and yet we have terms which distinguish the works from one another, and these may be regarded as equivalent. The names are not as dignified nor as honored, and yet they are expressive. The prehistoric monuments have already been classified according to these names, and the Indian, the Mound-builder, the Pueblo, the Aztec, the Nahuas, the Maya, and the Peruvian style of building have all been recognized. The early stages of architecture in the Old World were marked by dissimilarities, and they can be traced back to causes which prevailed in prehistoric times. In America the architecture is nearly all of

it prehistoric, but the dissimilarities are here to be observed in the early and primitive as well as in the later or more advanced stages. In the Old World we go from one country to another and trace the correlation between the architecture and the geographical surroundings and physical environments, and say that climate, soil, means of subsistence, employment and social status, all had their influence upon the architecture.

In America, however, we have the same correlation; each district and each native race had an architecture of its own; an architecture which was influenced by the environment. It might also be said to present a picture of the native cult as well as the social status. It was not only true that different grades of art and architecture appeared in different parts of the country, but different ideas and traits were embodied in them. The geographical surroundings and the physical environments had much to do with this, the growth of architecture on the continent having obeyed the laws of development as well as the necessities of the people. We have on this account no less than five different styles of architecture; each style being suggestive of a different social grade as well as of a different mode of life. The employments varied according to the means of subsistence and these were influenced by the geographical surroundings; but the primitive architecture partook of all.

The same story is repeated here that may be read in the early architecture of the east; the sand plains of Chaldea, the dry climate of Egypt, the rock-beds of Assyria, the deep forests and mountainous coasts of Asia Minor, the sunny fountains of the Hellenic regions, the snowy heights of Etruria, and the gentle hills on the banks of the Tiber, were all crowned with monumental structures which indicated the life employment, social status, and ethnic tastes of the people. It is so in America; the ice-fields in the north, the deep forests of the interior, the fertile prairies of the east, the rocky mountains and deep canyons of the west, the sunny heights and sand plains of the south were all covered with the works of the prehistoric races which differed as much as those of the historic.

There were, to be sure, several grades of civilization in this country, and these overlapped as many grades in the Old World. Yet we may by comparison ascertain the limits of each, and we may find also the stages of civilization which were correlated to these grades. It is plain that civilization here passed beyond the earliest stages discovered elsewhere, and that it reached a position which entitled it to stand alongside with that found among some of the more advanced of the ancient kingdoms of the Old World. There are indeed some features of it which seem very rude, and if we were to confine ourselves to these we should say that civilization here was at a very low stage, but there are other features which carry it on to a high degree, and if we dwell upon

these we shall be convinced that it was at an advanced stage. The question of time is not to be considered, but only the question of degree. In time, the civilizations of the Old World ante-dated by many centuries those of the New World, the earliest rise having been there as early as 2300 B. C.; but here perhaps not earlier than 600 years after Christ, a lapse of nearly three thousand years being found between them. As to the styles of architecture, however, we may conclude that the early stage which

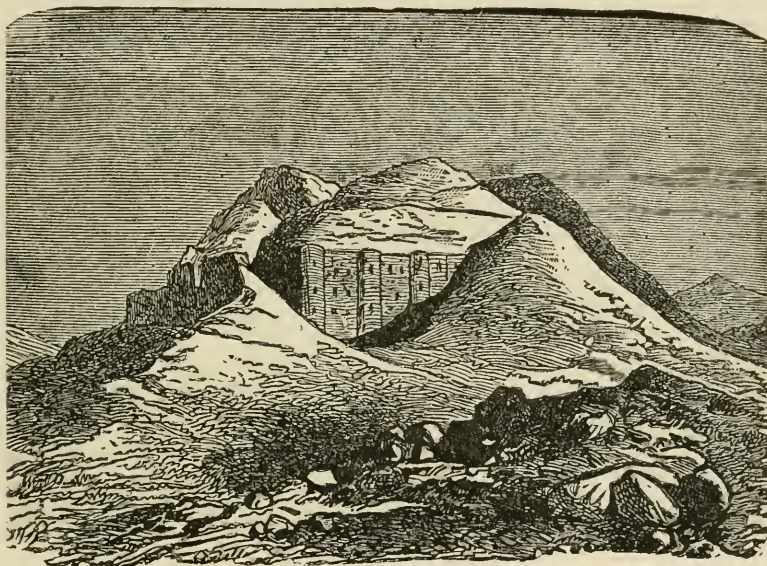


Fig. 1—Temple of Mugheir.

was represented by the Chaldean empire has its correlative among the monuments of America, but at the same time the stage which was reached by some of the later Assyrian monarchies has also its correlative. There is significance in this fact. The civilization of the New World had a much more rapid growth than that of the Old World, and yet it seems to have been a growth which was independent and in a parallel line, but separated and isolated.

I. We begin with the earliest stage and take the pyramid as the structure which represents it. There are pyramids in America as well as in oriental countries. We therefore have a good opportunity for comparison. The pyramids of America may not be as old as those of Egypt or Chaldea, and yet they are nearly as primitive, and so illustrate the primitive stage of architecture. We shall first take up the pyramids of the Old World and show the differences between them as well as the resem-

blances, and then compare the American with them. The first specimen will be the famous Temple of Mugheir, which is said to date back to the times of Abraham, and even before. Fig. 1. According to Rawlinson it was dedicated to the sun divinity, and was first founded by King Uruk 2230 B. C., the name Ur being suggestive of the Biblical Ur of the Chaldees. The kernel of this solid structure is of sun-dried bricks; the face is divided by buttresses. There are the remains of a terrace, which consists of two oblong steps, the lowest measuring 60x40 metres, 12 metres in height, standing upon a platform six metres above the surrounding country. This is the oldest temple in the world. It is

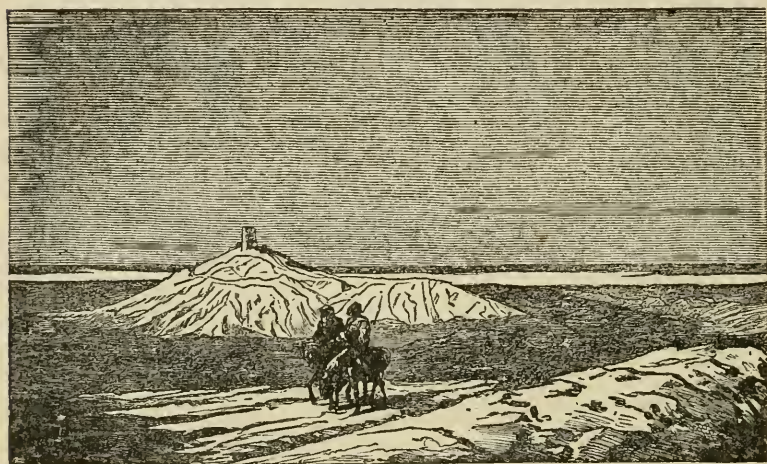


Fig. 2.—Temple of Borsippa.

supposed that the Chaldean temple consisted of a simple and massive terrace, crowned by a chapel and richly decorated with gold ornaments; the sides plainly buttressed and solid throughout. The next specimen is that given in the cut which represents the Temple of Borsippa, which tradition makes the same as the tower of Babel; though it was frequently rebuilt, Nebuchadnezzar completing the structure, called it the Temple Pyramid of the Seven Spheres. See Fig. 2.

This immense hill of rubbish stands entirely isolated in the desert. It has a lower circumference of 685 metres. It is uncertain whether it was all artificial or whether a natural elevation was selected on which to erect a terraced temple. It appears that it was a temple devoted to sun-worship, as many of the terraced temples in Chaldea were. The dimension agrees tolerably well with the six stadia given by Herodotus, as the measure of the first step of the terraced pyramid. There were regularly diminished seven steps in this pyramid, and upon the summit

stood the small temple which was devoted to the sun divinity. Each of the seven terraces was dedicated to one of the seven planets and was characterized by its color—the upper, gold; the second, silver; the next, red, blue, yellow, white, and the lowest black, according to the colors assigned to the sun, the moon, Mars, Mercury, Jupiter, Venus and Saturn.”*

The next specimen represents the pyramid of Meydoun, (see Fig. 3), a pyramid which was erected soon after the pyramid of Gizeh. It shows the manner of constructing pyramids in Egypt, namely in terraces, exactly as the pyramids of Assyria were constructed. There is to be sure a difference between them, in that the steps of the Assyrian pyramids are broader and farther apart than in the Egyptian. The difference is owing to the fact

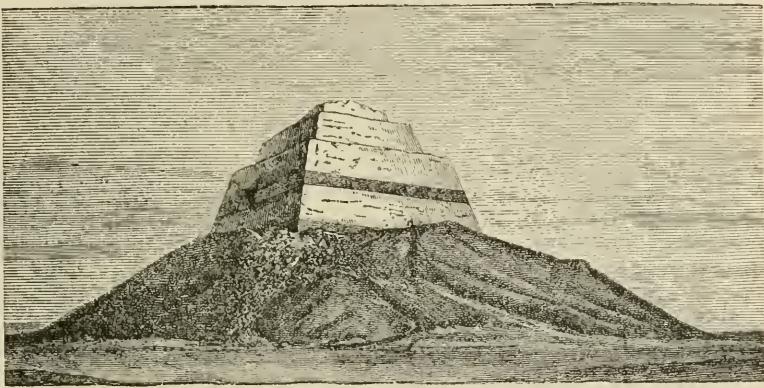


Fig. 3—Pyramid of Meydoun.

that the object in Assyria was to erect a structure on which processions could ascend, and on the summit of which a shrine or temple could be constructed; while in Egypt it was to construct a tomb in which their kings might be buried. The pyramids in America were in this respect more like the pyramids of Assyria or Chaldea. They were connected with palaces and were used as shrines and temples and for sacrificial purposes; the kings having their abode in the palaces close by those of the priests.

As to the manner of constructing the pyramids, there was a difference between the Chaldean and the Egyptian. The remains in ancient Chaldea are generally nothing more than formless heaps of rubbish, many of which have not yet been opened; but enough of them have been opened to show the manner of their construction. In Egypt the pyramids were built of layers of solid stone with a large chamber in the center. In Chaldea

*See History of Ancient Art, by Reber, page 57.

they were built of brick, and were solid throughout, making up by thickness of the masonry for the firmness lacking in the material. They further strengthened the massive walls, with a facing, or with buttress-like piers of burnt brick. The Chaldean temple consisted of a single massive temple of few steps, crowned



Fig. 4.—The Pyramid of Cholula.

by a chapel, which was richly decorated with colors and gold ornaments, with gold plating to represent the sun. In America the pyramid was built in terraces and may have been solid throughout, though there are evidences that some of them contained arched chambers within the mass, and yet those which were solid had air-channels similar to those found in Chaldea.

The specimen which we first select in America for comparison

is that of Cholula. See Fig. 4. This is one of the largest and perhaps one the most ancient of the American pyramids. What is more, there is a tradition of the deluge connected with it. The method of constructing this pyramid was by terraces, the terraces being made on the sides of a natural hill, but the summit crowned by an artificial pyramid and temple. We here call attention to the resemblance between the American and the Chaldean pyramids. One peculiarity of the American pyramid was that it was partly natural and partly artificial. This was also the case with the Oriental pyramids. Reber says "that the terraced pyramids of Koyundjic was a terraced structure of three or four steps, situated upon a natural elevation." The lower terrace is decorated with pilasters in low relief. This is one of the earliest of the Oriental temples.

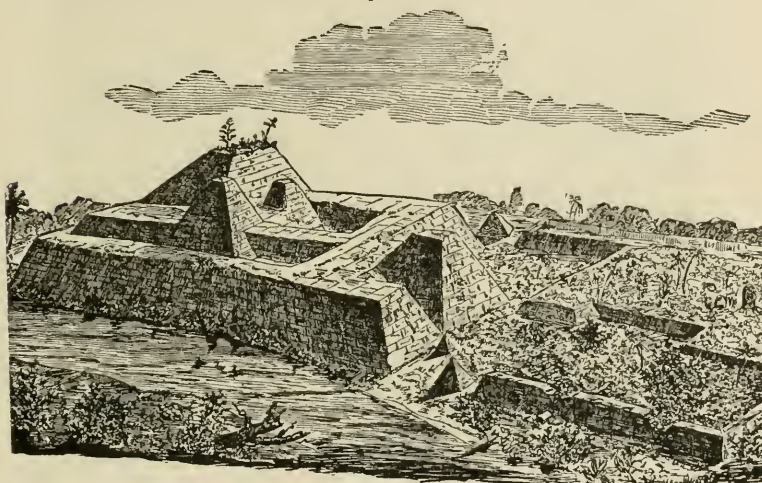


Fig. 5—Pyramid at Copan.

We refer to another specimen of an American pyramid to illustrate this point. It is a pyramid found in Peru—a pyramid built in terraces, the terraces on the side of a natural elevation. We do not claim this to have been a temple, for it was a fortress—the fortress of Huatica. Yet terraces on the side of the hill show how the pyramids in America are constructed. There is another heap of ruins in Peru, a cut of which we do not present. This was the temple of Pachacamac, twenty miles south of Lima. It was constructed of terraces and was devoted to the worship of a fish-god, and is said to have been resorted to by pilgrims from all parts of the coast. Some maintain that the Incas erected on the summit of this hill, a temple of the sun. There are rooms in this temple which are filled with enormous quantities of earth, though how it came to be there is unknown. The ruins are largely artificial, but it is supposed that the cen-

tral core of them is natural, but that the terraced pyramids sustained or supported an ancient temple of magnificent proportions.

Other specimens of American pyramids are found in widely separated localities and embrace structures which were devoted to very different uses, but they show the American peculiarities. The pyramids were used here for fortresses as well as for temples. In fact pyramids sustained palaces as well as temples and both were regarded as fortresses. In Peru the differentiation may have been more marked, for there are pyramids which were used for fortresses, others for burial towers, and still others for

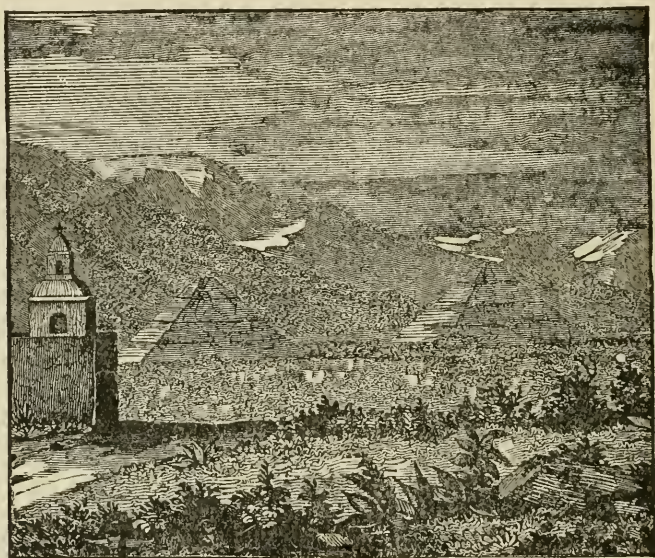


Fig. 6—Pyramids of the Sun and Moon at Teotihuacan.

temples, while in Central America they were all combined in one.

Another point in connection with the pyramid in America is that in finish and elaborateness it was unexcelled by any of the pyramids of the Old World. The Egyptian pyramids were very plain structures. They were never covered with carving and never showed art or architecture at a high stage. The terraced pyramids of Assyria were much more advanced than these, but the pyramids themselves, if we leave off the palaces which were built upon them, were not at all equal to those in America.

We give two specimens of perfect pyramids which have been found in America, namely, the pyramids of Copan and those at Teotihuacan; these we think compare with any of the Egyptian pyramids in symmetry and beauty, though they are not as large. Fig. 5 and 6. If, however, we were to restore the palaces

which formerly stood near these pyramids and could show the broad path of the dead, so-called, lined with the elaborate structures which have now disappeared, we should conclude that the American civilization was fully equal to the Egyptian at the time that the pyramids were built. These pyramids are, however, not the best. There are pyramids at Tusapan and Papantla, which have their exteriors built up with seven terraces, each terrace having an elaborate cornice, with panels below the cornice. Tall buttresses also project from the terraces, forming a massive and elaborate finish to the whole structure. There is at ChichenItza also a pyramid which has a stairway running up its entire side, which in massiveness and breadth and elaborateness of detail is not exceeded by any of the stairways of the Assyrian palaces. Charnay has spoken of this pyramid and has given a new and interesting description of it. The same is true of the pyramid of Uxmal, at Tikal, Kabah, Izamal and several other places. The south side of the pyramid at Izamal is built up of stone, laid without mortar and rounded off at the corners.* On its side near the basement stands a gigantic face, which was reproduced by Stephens, 7 feet 8 inches high, the features rudely formed by small rough stones fixed in the side of the mound by mortar, and afterwards perfected by stucco. The pyramid at Ake has also a face, and has also in its side a colossal head 13 feet high, formed by rough stones coated over with mortar, and one of the finest bas-reliefs, its principal subject being a crouching tiger with a human head, reminding us of the order of knighthood in which the tiger had the pre-eminence. It would appear from this that the pyramid in America combined the massiveness and solidity of the Egyptian, the terraced form of the Chaldean, the walled and palace-crowned quality of the Assyrian, and at the same time embodied the carved specimens which resemble the sphinxes of Egypt, and sustained on their summits temples and palaces which remind us of the Median and Persian. There is certainly nothing in all this to show that the American architecture was of an inferior or low grade, but there is everything to show that it was equal to that of the civilized races of the ancient monarchies even in their most advanced stage.

The style of the pyramids, however, does not fix the status of American civilization. There is evidence enough to show that the architecture of America passed beyond this elementary stage. We have dwelt upon the particulars only to show that there were elements or features which were like the early stages of architectures in the Old World. We now turn to consider the more advanced stages. We here find remembrances to the Assyrian style of building. It will, of course, be acknowledged that there was a similarity between the early Chaldean and the

*See Reber's *History of Ancient Cities*, p. 309.

later Assyrian, but the Assyrian was much more advanced of the two. Reber says "that the difference arose chiefly from the superior material at the builders' disposal in Upper Mesopotamia. The terraces of Assyria, like those of Chaldea, were solidly constructed of sun-dried bricks and stamped earth, but the neighboring mountains provided stone for the complete revetment of these masses with quarried blocks. Carefully hewn slabs existed upon the terrace platform of Sargon's palace, and upon the substructure of the pyramid of Nimrud, while there was rough Cyclopean stone-work employed in the construction of the city walls at Kish-Sargon."*

II. We next come to the walled structures of America. Here again we have all the variety which we find in the Old World,

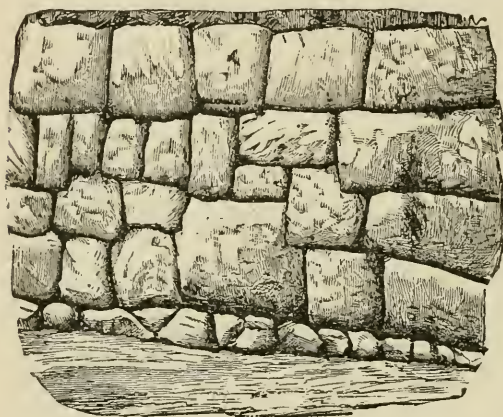


Fig. 7—Cyclopean Wall in Cuzco, Peru.

and we may believe that even these passed through many stages of development.

1. We first consider the Cyclopean wall. We take this wall as the earliest found in America as well as in the East. See Fig. 7. This might be regarded as evidence of a very primitive type of architecture. It is generally supposed

to belong to the earlier ages. "Between the Tiber and the river Arno there exist extensive remains of Cyclopean masonry as well as walls of hewn and squared stones. The age of these works can usually be roughly estimated; they are evidently of later antiquity than the carefully fitted masonry, the irregular horizontal courses of unequal thickness which form the older Latin ramparts, and these precede in point of time the exactly pointed blocks of the Servian walls of Rome."†

There are many specimens of walls in America, which resemble those built by the Etruscans, Pelasgians and early Latins, though they had an entirely isolated history and cannot be traced to any other country. We give here a cut to illustrate this point. It is a wall found in Cuzco, Peru. See Figs. 8 and 9. This city, it appears, stands on the slopes of three hills. The ancient builders had to resort to extensive terracing in order to secure level surfaces on which to build. These terraces, built in a substantial

*See *History of Ancient Art*, by Reber, p. 62.

†Reber, *History of Ancient Art*, p. 414.

manner and faced with stone, are still standing in many places. It is a part of a fortress which was a remarkable structure. The walls support terraces, but they rose above the terraces so as to form a parapet, and yet they projected out at angles so as to form bastions. The height of the outer wall is at present 27 feet, the



Fig. 8—Terrace Walls in Fortress at Cuzco.

width of the terrace 35 feet; the second wall is 18 feet high, terrace 18 feet wide; the third is 14 feet high. To prevent the accumulation of water, channels were cut through the walls at regular intervals. This structure constituted a citadel which overlooked the city of Cuzco. The height was very precipitous and the ascent difficult, but it was a place of resort in time of danger.

There is another example of the Cyclopean wall in the Temple of the Sun at Cuzco, which is the grandest structure in the region. The Cyclopean wall forms the foundation for the temple, but the temple itself is built of regular blocks of stone, with perpendicular walls and with the corners rectangular and perforated by windows,

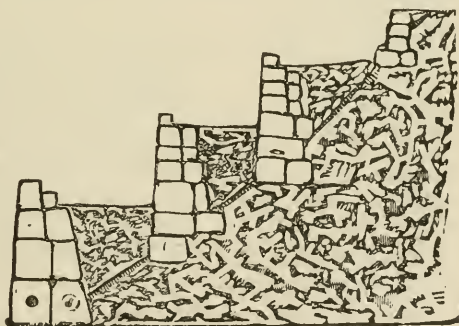


Fig. 9—Section of Terraces in Fortress at Cuzco.

very similar to a modern building. The structure has been modified and now contains a balcony and arched windows and modern additions, three types of architecture in one building.

In reference to the walled structures of America it would seem as if they gave a complete history of so-called wall-architecture. There are walled chambers or cists among the mounds, walled houses among the Cliff-dwellings, walled palaces and temples among the ruins of the ancient cities as well as the walled fort-

resses found in Peru. It is interesting to notice the variety and at the same time to study out the various ages of development.

We give cuts here to show this point. The first represents a stone cist in a mound in Missouri. See Fig. 10. The second represents different kinds of masonry in walls of the Cliff-dwellers' houses. See Fig. 11. The third represents a wall

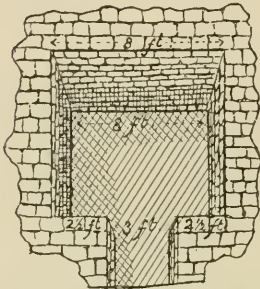


Fig. 10—Stone Cist in a Mound in Missouri

found on the mesa in Colorado. Fig. 12. It may be the remains of an old pueblo house. The fourth is the two-storied, walled house in the ruins on the island of Titicaca. The fifth is the structure at Uxmal called the Governor's House. These five cuts give us the different specimens of walls found on the continent of America, and represent the different grades of architecture prevalent, namely that of the Mound-builders, the Cliff-dwellers, the Pueblos, the Peruvians, the Central Americans.

It will be noticed that as we ascend in the scale, the wall is more complete and finished; that of the civilized races of Central American being the most complete of all. This is seen in the manner of building the wall as well as in the material used. The Mound-builder used the flat stone which abounded in the region; his skill was exercised in making a square chamber out of stone laid up in a dry wall. The Cliff-dweller also

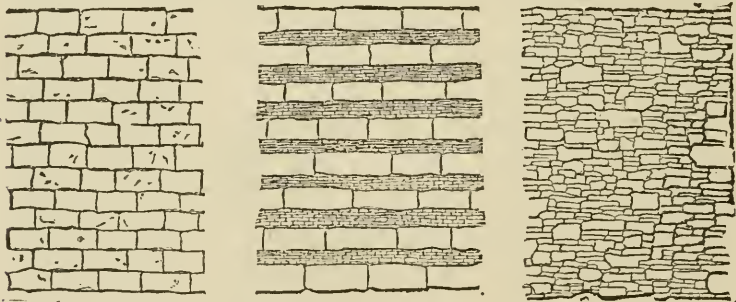


Fig. 11—Regular Masonry—Cliff-dweller's House.

used flat stone, such as was found in the vicinity; the layers in this wall varied according to the size of the stone; his skill was exercised in erecting so many square buildings on such ledges as were found in the cliffs, and in adapting the size and shape of the building to the surroundings. The Pueblo used different material; adobe, limestone, anything that was convenient, but his skill consisted in erecting walls which were thick and massive, so as to sustain heavy, many-storied buildings. The Peruvian also used such material as was presented.

His skill is shown in erecting finished buildings, buildings which contain doors and windows, and the various elements of architecture which are found in modern structures. The Central American excelled them all; he used rough, dressed stone for the lower part, but carved, wrought stone with cornices and entablatures and occasionally columns for the upper part. There are no very large stones in any of these buildings. The only structure in which large stones were used is the one in the cut which represents the wall in the southwest part of Colorado,



Fig. 12.—Wall on Mesa.

and this was probably more a matter of convenience than a matter of skill. The masonry of America is in this respect in strong contrast with that of the Oriental countries, especially that of Egypt, the peculiarity of which was that such massive blocks were used.

We call attention to the temple at Carnac and to the tomb in the pyramid at Gizeh. In these the stones are all massive blocks, which must have required great strength to put in place. In the ancient wall in the temple at Jerusalem the stones are also large and heavy, and have a beveled form of dressing. No such walls as these are found in America. The skill of the American races did not consist in lifting great weights nor in building walls with massive and beveled stones. See Fig. 15. Still that there was skill exhibited in the walls in America is evident from various specimens presented, especially in Central America. Here the wall is highly ornamented, great skill having been exercised in sculpturing figures upon the face of the wall.

2. This brings us to the finish and ornamentation of the wall. In this there are some remarkable resemblances between

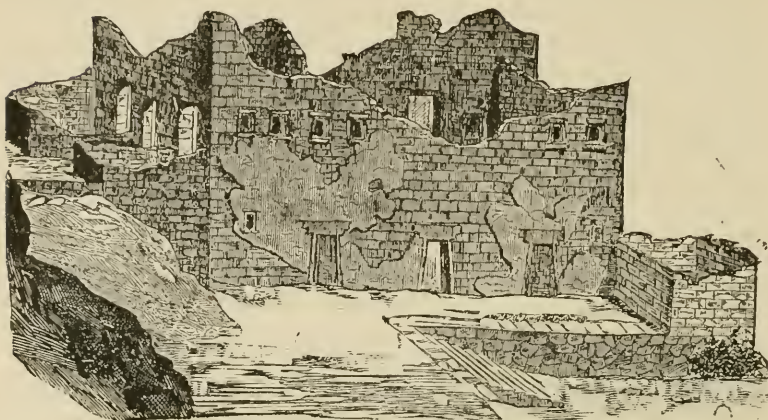


Fig. 13.—House on Island of Titicaca.

the architecture of the New and the Old World. We first refer to one peculiarity which has impressed many writers on archi-

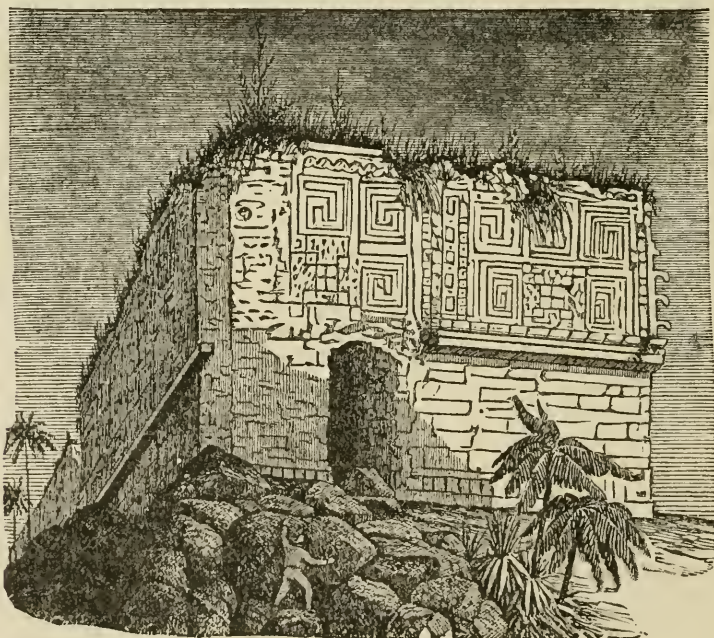


Fig. 1'.—Governor's House at Uxmal.

itecture—the imitation of wood-work which is found in the stone structures. This was first noticed by Fergusson in Assyria. It,

however, may be seen in Egypt and is very common in America. We give cuts to illustrate the point. One of these represents an Egyptian tomb, the stone sarcophagus of Mycerinus. See Fig. 16. On the front of it may be seen the imitation of wooden frame-work, as well as wooden cornice, the whole surface being covered by projecting columns, beams, with panels and door-ways between them. This peculiarity has been noticed in America. The facades of the palaces are frequently ornamented in this way. A specimen may be found in the facade of the



Fig. 15—Wall in Temple at Jerusalem.

Casa de Monjas at Uxmal, where the upper part of the wall is covered with lattice-work in stone—a close imitation of wooden lattice-work. See Fig. 17. Another part of the same building is ornamented with lattice-work, on which are eight parallel, horizontal figures, resembling wooden bars, each terminating at either end in serpent's heads with open jaws, the bars increasing in length as they approach the upper cornice. Violet le Duc imagines this to have been an imitation of a primitive style of wood-work. Figs. 19 and 34. The same peculiarity will be noticed in the cornice; in this there are ornaments which resemble small blocks of wood, and others resembling rosettes. We call attention to this peculiarity of the walls, for it illustrates a point. The primitive ideas were retained in America even when

the architecture reached a high stage. The same features which in Oriental countries were dismissed and disappeared, survived throughout all stages of development. We think that any one who looks at the ornamented walls and takes the pains to trace

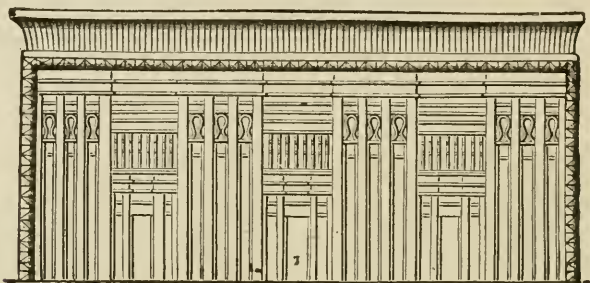


Fig. 16—Egyptian Tomb.

the many and elaborate patterns found upon them will see much skill in execution. Some of the patterns are so elaborate as to almost defy analysis. They would be very difficult if they were carved in wood, but here they are wrought in stone and are objects worthy of admiration. These ornaments, however, are not as simple as they at first appear. They contain not only the imitations of wood-work, but many elaborate and highly finished

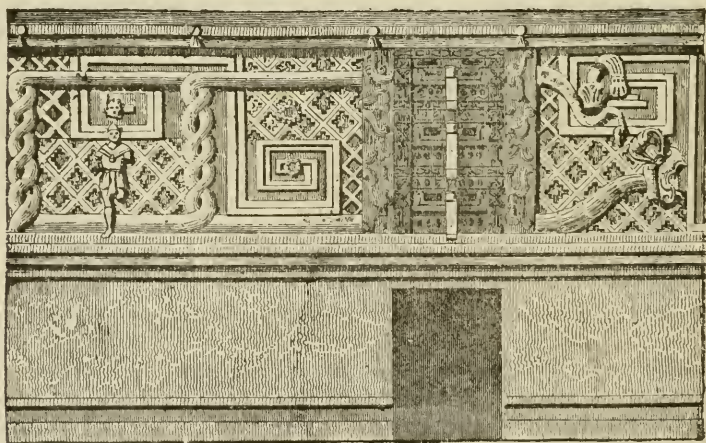


Fig. 17—Imitation of Lattice Work and Roman Key, at Casa de Monjas.

conventional patterns, as well as symbolic figures, three qualities combined in one. In this the American architecture is peculiar. The rock-cut tomb of Beni-Hassan contains imitations of wooden beams and cornice, and some of the Assyrian palaces contain imitations of lattice-work; but the American facades contain

symbolic figures, which make them representatives of a native mythology, the face of the divinity frequently peering out from among the elaborate ornamentations found here. We find also some strange resemblances to Old World patterns; specimens of the so-called Roman key or Greek fret, occasionally specimens

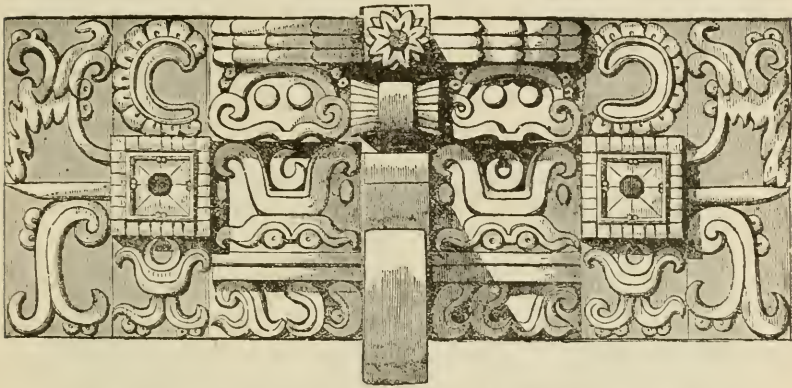


Fig. 18—Elephant's Trunk and Eye and Ear Ornaments at Milla.

of the cross and the "suastika," but along with these the so-called elephant's trunk and eye ornaments, which remind us of the Chinese way of decorating their pavilions, a wonderful mingling of familiar figures with those which are outre and unfamiliar. See Fig. 18. They are suggestive of a barbaric splendor which was equal to that reached by many of the monarchies of the Old World; yet it was a splendor that was peculiar to

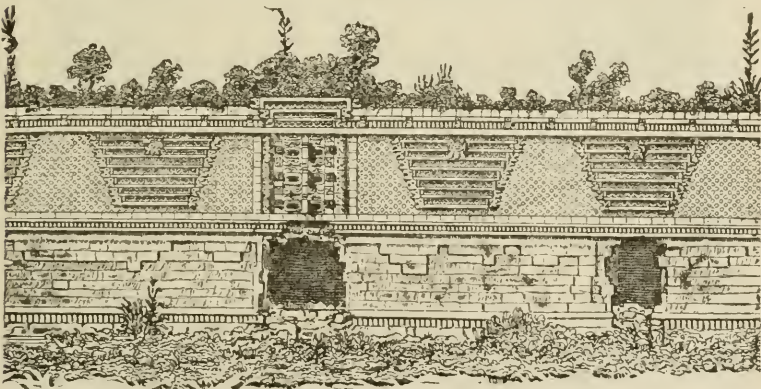


Fig. 19—Bars with Serpent Heads—Casa de Monjas.

America. We can hardly compare the two, though we may fix the stage which was reached by American ornamentation.

3. The cornice. It appears that the cornice was a prominent element in the temples and palaces of America, and was sometimes even placed upon the pyramids. The cornice was, how-

ever, peculiar to the civilized races; it is never found among the uncivilized races. The nearest approach to it is found in the projecting beams which support the floor of the terraces of the pueblo houses. The history of the cornice in America has never been written; we find it at an advanced stage. It appears in stone-work and yet contains imitation of wood-work. One of the earliest specimens of the cornice in the Old World is found in the temple cella at Amrith in Phœnicia. It is a plain bevel on the edge of a monolith which forms the ceiling of the cella without finish or ornamentation. The cornices in America



Fig. 20—Pyramid of Xochicalco.

are very much in advance of this. We give a specimen in the cut. It represents the pyramid of Xochicalco. See Fig. 20. We may notice that there was a double cornice passing around this building, and that what corresponds to the frieze has panels in it divided by the folds of a serpent, but filled with mythologic figures. It will be noticed that the shape of the building is pyramidal and resembles many of the structures in this respect. The whole wall on the front and end of the building is carved so as to represent monsters of various kinds; the carving passing over the joints of the stone, showing that it was done after the building was erected. This is a remarkable specimen of symbolic ornamentation, for the cornice itself contains symbols.

4. The subject of windows comes up in connection with the study of walls.

The use of windows was not common in America and yet there are a few buildings in which windows appear. We call

attention to the resemblance of the American and Assyrian architecture in this respect. It is said that the early Assyrian palaces had no windows, for the light was introduced through the doors. The same is true of the palaces of Central America. The doorways always opened upon the court, and therefore did not need protection. A curtain would shut off the view from the outside and the inmates could perform their duties in all the privacy that they desired. The palaces were provided with corridors on the outside—corridors which were always cool and protected the people from the rays of the sun. Figs. 21, 25.



Fig. 21—Doors used as Windows.

The manner of constructing windows and of lighting the rooms should be noticed in this connection. It is remarkable that the window was one of the late inventions. It does not appear in Oriental countries until quite late in history. It does not appear in America until we reach the fourth or fifth stage in the line of architecture, but even here it is doubtful whether the window was not a door. There are openings in the cliff dwellings which remind us of the windows of modern houses. We give a specimen of one of them. See Fig. 22. It will be noticed that this is rudely constructed.

There is no jamb, no casing, and no sill. The window cap is a mere rude block of stone, which is placed across the top of the walls and forms a lintel. It looks like a window, but the building in which it appeared had no other opening, and we conclude that it was a door. The same is true of the openings between the walls of the pueblo houses; they resemble windows, but they are doors. The only ancient building in America which has genuine windows in it is the two-story building on the island of

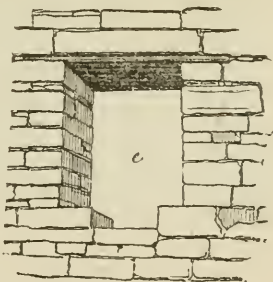


Fig. 22.

Titicaca; this, however, may have been erected after the time of the discovery, the original shape of the doorways being preserved, and the windows being added as a borrowed feature.

III. We now come to the architectural principles, and take up the various specimens of them, such as the pier and lintel, arch, column, etc., especially as these are found in America.

1. The pier and lintel will first come up for study. These are among the earliest of architectural devices. They are not peculiar to civilization, but appeared long before; yet there is a

development, especially of the ornamental pier and lintel, which only occurs among civilized people. This is a proof that the American races reached a high degree of civilization.

The pier and lintel always have a history. The doorways of the Assyrian palaces were generally constructed with heavy piers, which were surmounted by a single stone for a lintel. They were colmens on an advanced scale; the only specimens of which belonged to the prehistoric age. The history of the pier and lintel has, however, been traced up to advanced points in America. We begin with the Peruvians. There are certain edifices which have doorways which resemble those found in the early Etruscan temples. We give a specimen of one of these. See Fig. 13. It will be noticed the jambs of the doorways as well as of the windows are on an incline, and in this respect resemble the doorways of the Egyptians as well as of

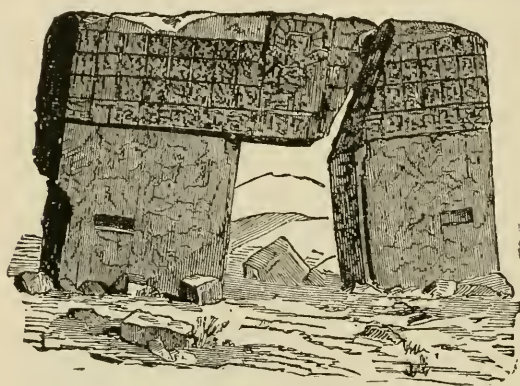


Fig. 23.—Gateway in Tiahuanaco.

the Etruscans. We call attention to the fact that the building is two-story and has a massive and solid look, which is rarely found in American structures. There is also a gateway in Peru which illustrates the same point. See Fig. 23. This gateway has its jambs inclined inward at the top, but it will be noticed that the wall above the gateway is elaborately ornamented. The peculiar feature of it is that the whole was cut out of a solid mass of stone. It is now broken and does not show as much grandeur as it once did. The gateways of Egypt are celebrated for their grandeur. There is a propylon at Carnac which illustrates this. It would seem as if the skill of architecture had expended itself upon it. If we compare the Peruvian with the Egyptian we find it greatly inferior. Perhaps this will lead us to fix the Peruvian architecture at comparatively a low stage.

Still the pier and lintel in America were, in some respects, superior to those found in Oriental countries, especially in ornamentation. The piers in the temples at Uxmal are ornamented in a very elaborate way. They contain figures of priests and various symbols which are significant. These may be compared to the human-headed bulls which guarded the doorways to the palace at Nineveh. Were we to compare the ornamentation we should say that the piers and doorways in American

palaces and temples were quite equal to the Assyrian. The same is true of the lintels. Stephens found lintels of carved wood which called forth his admiration so much that he actually removed one specimen and transported it to New York.

2. We turn to the arch and shall compare it with those found in the ancient structures of the East.

(1.) We are to study the history of the arch. It appears that the arch is found in America as it is found in the East, but the principle of the arch was here unknown. It is therefore only in the early stages of its development that we find the resemblances. One

specimen consists of massive stones laid up at an angle, the upper ends resting upon each other. This is perhaps the earliest form of the arch. We give a cut to illustrate it. It represents the great pyramid of Gizeh. Plate I. An arch constructed upon the same principle is found in the portal of Delos. No such arch has been found in America. Next to this is the arch which was made by masonry with stones laid in the shape of a vault, cut so as to make the ceiling hemispherical. A specimen of this is found



Fig. 24.—Tomb of the Third Pyramid.

in the tomb of the third pyramid. See Fig. 24. The third form of the arch is one that was common in Chaldea. It was formed by masonry, each layer jutting over the other.

It is said that the tomb of Mugheir has an arch of this kind. It is a false arch; the layers of brick being placed over one another and projecting out so as to form an arched ceiling. This chamber shows that the principle of the arch was not known in the ancient Chaldean period. The same is probably true of the ancient architecture of America. There are many false arches resembling this of the early Chaldeans, but no true arch, yet the arch was used more effectively in America than in Chaldea. The arch served an important purpose in the palaces as well as in the pyramids. It not only entered into the foundation, serv-

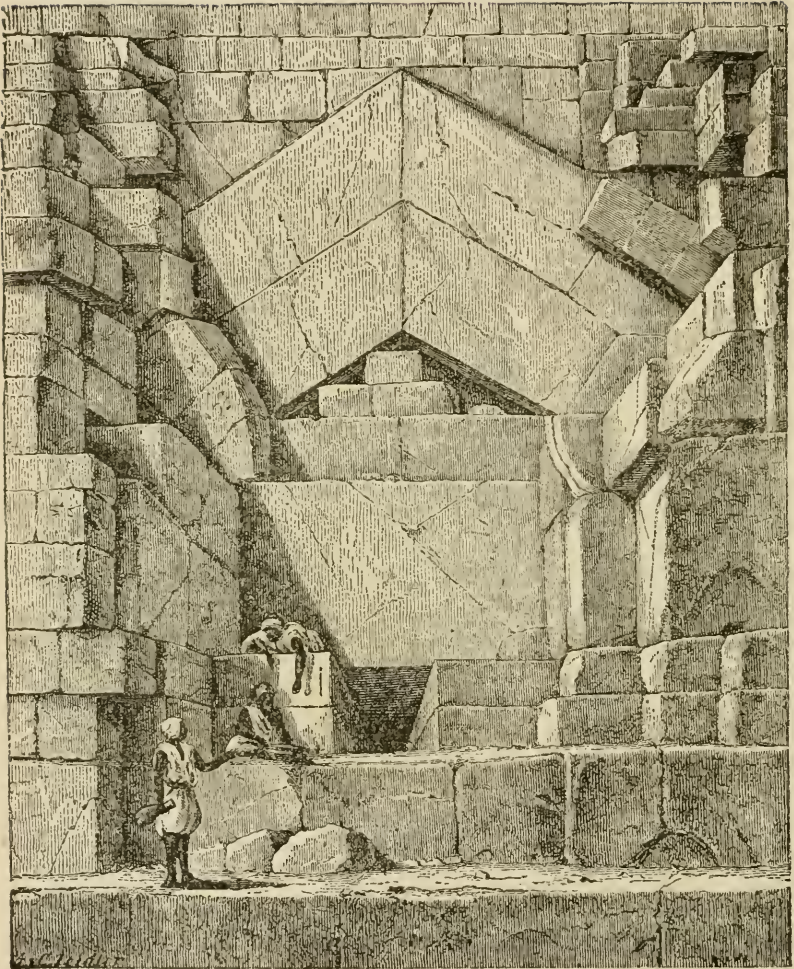


PLATE I--PYRAMID OF GIZEH.

ing as a support for the stairways and for the steps of the terraces, but it also was an important element in the superstructure. The corridors were all made up of arches. The chambers and corridors were narrow, to render it possible to cover them without the introduction of immediate supports.

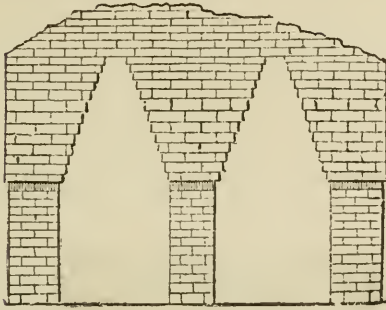


Fig. 25—Cross-section of Corridors at Uxmal.

spaces. They were the result of a constructive necessity. "A greater width than that permitted by the arch or by the span of ceiling-timbers was only to be obtained by the erection of a division-wall to prove a subsidiary support for the beams. So helpless a make-shift, destroying the unity and grandeur of the hall, could have been adopted only in entire ignorance of the opening and supporting element of the column, apparently never recognized in Assyria."* The arch was not merely an architectural device designed to support the massive walls and roofs of the chambers and corridors within the buildings,

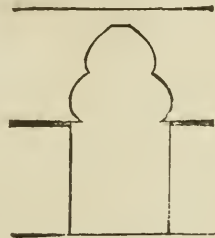


Fig. 26—Trefoil Arch.

but it was also used as an ornament. We give cuts to illustrate the points. One of them is a cross-section of the corridors at Uxmal. It shows how useful was the arch in this building. See Fig. 25. Another gives the shape of the openings into the corridors and shows the architectural device which made the arch an ornament as well as a support. It is a trefoil arch, reminding us of some of the ornamental arches which appeared in Europe during the Middle Ages. See Fig. 26.

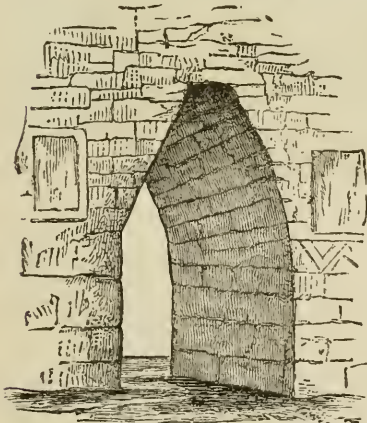


Fig. 27—False Arch from South America.

These all show how the false arch was constructed. It will be noticed that the stones project over one another and that they are beveled out so as to make

*See History of Ancient Art, by Reber, p. 69.

a false arch in the form of a vault, but without the principle. These are the arches found in buildings. There are, however, arched gateways in Peru which are as impressive architectural feats as are these vaulted ceilings and corridors found in the palaces. See Fig. 27. It would seem that gateways were used in all countries as signs of magnificence, and therefore great efforts were used to make them imposing. The following cuts represent gateways, one at Kabah and one at Labna. They remind us of some of the arched gateways of the Roman empire. They are very interesting specimens of aboriginal

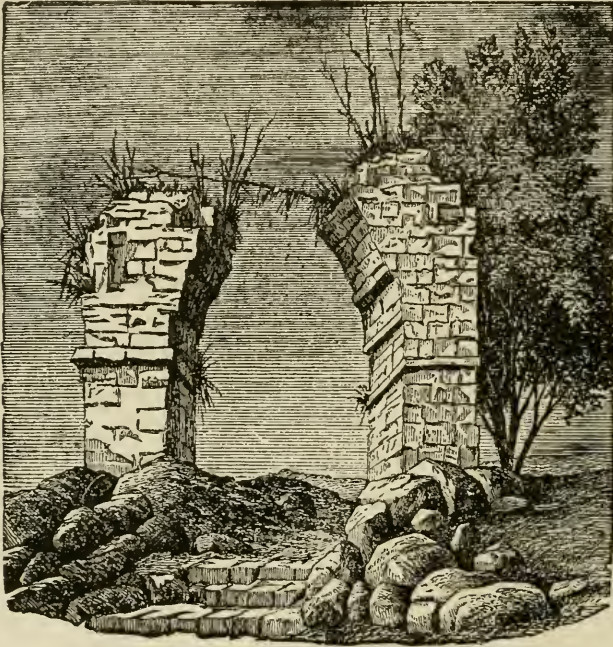


Fig. 28—Arch at Kabah.

architecture. See Figs. 28 and 29. In some respects they surpass the gateways of the Assyrian palaces, for there were no arches in them. There was a great effort on the part of the civilized races to reach the grandeur which the arch can give to structures made from stone, and they succeeded in many cases. It will be remembered, however, that the principle of the arch was lacking in all these specimens. The support does not come from the keystone, but only from the strength of the masonry.

3. We next come to the column. The column was used in America during prehistoric times, but was only used by the so-called civilized races. In this respect the column and the arch are to be classed together; both of them are factors which be-

long to an advanced stage of art and architecture and are signs of civilization. The column, however, is a better index of the degree of civilization than the arch. At least we may learn from it the stage which had been reached by art and architecture, and by parity of reasoning, we may conclude that other things were similar to it. In America the column is a better index than in Oriental countries. In the latter countries it is an index, but its form is so varied and its history so prolonged that it lacks definiteness; while in America its history is limited and it has more definiteness of form. We learn from it the exact position of the architecture of America in the long march of the

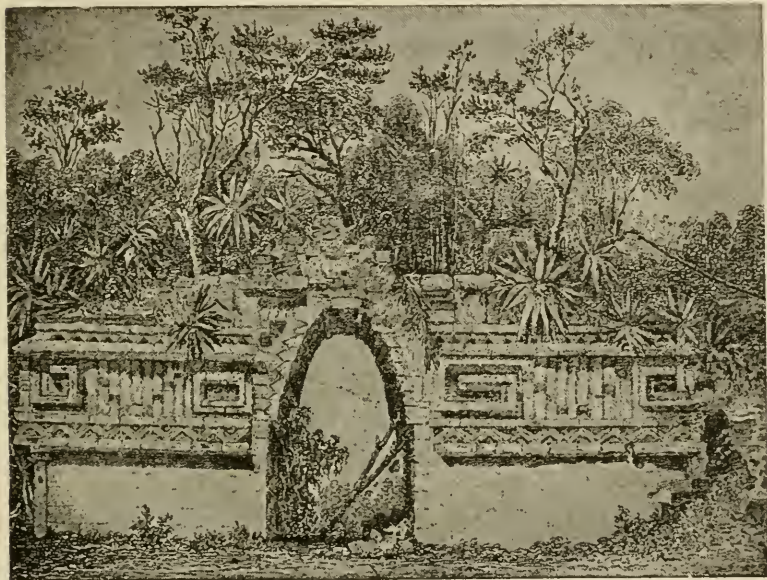


Fig. 29—Roman Key, Clustered Columns, Banded Cornice and False Arch at Labna

ages, and we may decide whether it has been over estimated or not. The history of the column in Oriental countries is, however, to be reviewed if we are to understand the subject. We first take its history as it appeared in Egypt. Here we have a complete line of development and a series which shows the different stages which were reached. The earliest specimen of the column is that found in the tomb of Beni-Hassan. It is a sixteen-sided column and has a plain capital and pedestal and is used for the support of the lintel of the doorway, and of the roof of the chamber. It is called the Proto-Doric, but it originated from the duplication of the sides and angles of the square pier; the pier transformed first into an eight-sided and afterward into a sixteen-sided shaft. Both forms of the column are found in this tomb; they are supposed to belong to the twelfth dynasty—a dynasty which followed the fifth, in which

the pyramids were built, but with a considerable interval between. This was the earliest stage of the column found in the historic countries. See Fig. 30. There were other kinds of the column which followed this, one of them being characterized by the decoration of the capital in the imitation of the bud of the lotus. This appeared under the reign of Rameses II. and may be seen in the great temple at Karnak. A third type was that which appeared under the reign of the Ptolemies. This consisted in the broadening out of the column into the shape of the calyx or flower of the lotus, the sides of the capital being painted so as to represent the petals of the lotus. Following this was the transformation of the shaft, the column being dec-



Fig. 30—Tomb of Beni-Hassan.

orated with paintings and covered with hieroglyphics. This constituted the fourth stage. The fifth kind was reached when the column lost its shape as a shaft and became a caryatid, the human form elaborately sculptured, being made to serve as a column. Here then we have the five stages of growth in Egypt. We give cuts to illustrate this. First is the tomb of Beni-Hassan, of the twelfth dynasty; second, the ruins of Seti at Abydos, son of Rameses I., who belonged to the eighteenth dynasty. The third is the temple at Quarnah, built by Rameses II., of the nineteenth dynasty. The fourth is the Memnonium of Rameses II., of the twenty-fifth dynasty, at Thebes. This building contains carytids which represent the fifth stage of development. See Figs. 30, 31, 32, 33.

These represent the progress of the column from the earliest stages up to its complete development. We also give a view of

the ruins at Karnak, which contain in themselves a complete history of the column. In this cut we find not only the pier and lintel, but the simple column with a plain capital. We have also in it the column with the lotus-headed capital, though it lacks the ornamentation and hieroglyphics. The obelisk, however, makes up for this. The obelisk was of a late growth and hardly belongs to the same class as the column and yet it is instructive as it illustrates one line of development and one use or office to which the column was subjected. See Plate II.

We also take up the history of the column in Assyria. Here the earliest stages are involved in obscurity, and yet enough is

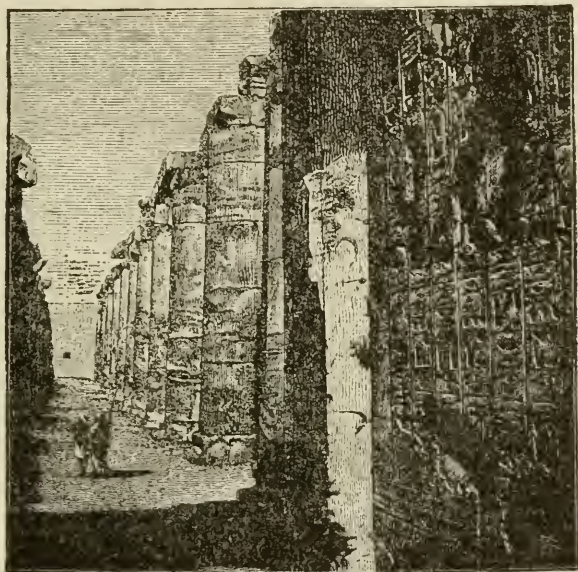


Fig. 31—Ruins of Seti.

known of it to fix upon the different forms. The temple of Mugheir gives to us the earliest stage. See Fig. 1. In this the column is but a simple projecting buttress with an entablature. Next to this is the column which stood between the piers and formed the openings to the windows. Here it served only as an ornament, not as a support. Next to this is the column as it appeared in the northern palace of Coyundjic in which the capital is decorated. There are two columns between two pilasters, which support the entablature and the roof. The development of the column after this is rapid. It does not, however, serve very much as a support until the Persian empire is introduced. Persian columns with bull capitals are numerous. The columns of Assyria were employed in a subordinate position, and were used only as ornaments, reliefs, and not as supports. The As-

syrian palaces were on this account unable to fulfil the demands of a monumental architecture. "The fundamental principles of vaulted construction, as of columnar architecture, were known in Assyria, but neither the column nor the arch was worthily

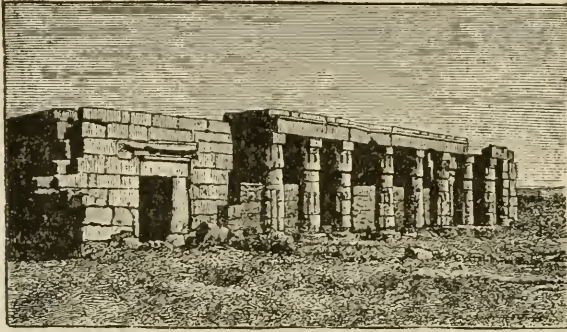


Fig. 32—Temple at Quarnah.

recognized and developed into an important feature, capable of exercising an influence upon the extent or form of the enclosed spaces.”*

The question now arises about the column in America. What was its position in the architecture of the New World? Did it

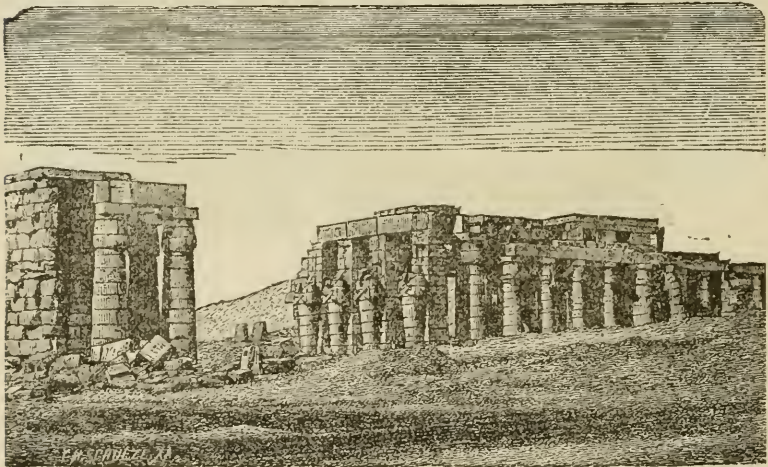


Fig. 33—The Memnonium.

belong to the early or later stages? In answering this question we shall first refer to the form. (1.) We notice that it is a simple shaft and lacks the capital and pedestal. If it has the capital at all it is a plain block, without ornamentation and dec-

*See History of Ancient Art, by Reber, p. 71.

oration. There are columns which have bands about the center, some of the bands being somewhat elaborate. Fig. 34. We should say, in reference to the form, that it belongs to an primitive stage and might naturally be classed with the early Doric or Proto-Ionic. (2.) As to the office of the column we find that it rarely serves as a support, though sometimes it is placed as a division to the doorway. In this respect it resembles the Persian columns in Assyria, the use of which was mainly to make divisions in the windows or supports for the window-caps. The column rarely served in America as a support, though there are a few exceptions. (3.) The use of the column as

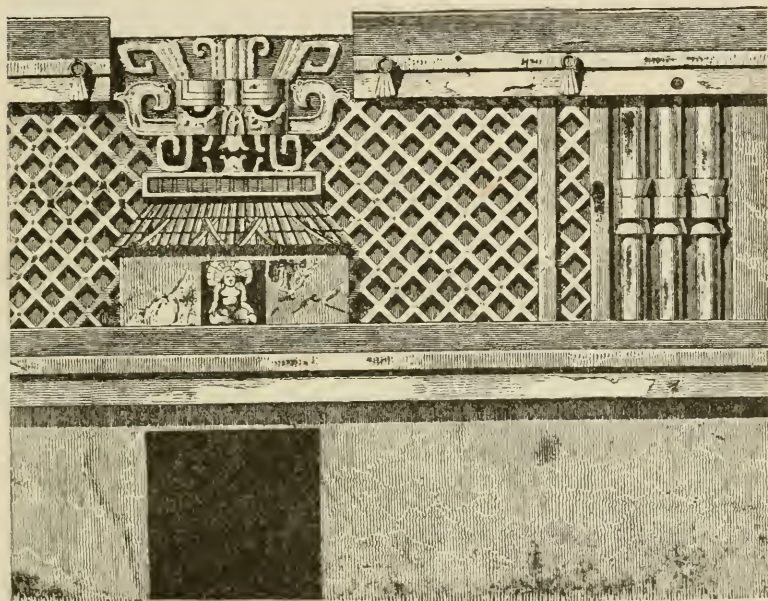


Fig. 34—Column from Palenque.

an ornament is very common. There are at Palenque facades on which the columns appear in connection with the imitation of lattice-work between the double cornices and make panels on the frieze. In the panels there are ornaments in imitation of the huts or common houses of the people, surmounted by the emblems of divinity, with the image of divinity in the doors. These columns are, some of them, flat and some round; the round are finished with bands in the center and are arranged in triples. They are not used for support, but for ornament. There are, however, other buildings in which the column is differently used. Bancroft has mentioned the various localities where they appear. Among these may be mentioned the row of round columns on the terrace of the Governor's House at Uxmal, sixteen columns at Xul from the ruins of Xochacab,

thirty-six square columns on the summit platform of the pyramid at Ake, three hundred and eighty short pillars, also square, arranged round a square at Chichen-Itza, eight round pillars on the terrace of the round house at Mayapan, the reported line of square columns originally supporting a gallery at Merida, and finally the monoliths of Sijoh.* Columns appear also as ornaments at Casa Grande, at Zayi, also in the building and gateway at Labna. See Fig. 23.

The column ordinarily is nothing more than an ornament, and cannot be regarded as even reaching the position of an architectural principle. It introduces a style, but does not introduce an order. There is a whole realm of architectural development beyond it. Still, we may say that the column occupied the same position in the architecture of prehistoric America as in ancient historic countries.

4. The decorations which are occasionally seen upon the column are instructive. There are columns in America which are elaborately decorated. The columns of Egypt, which were erected in the eighteenth dynasty, are not more ornamented than these. To illustrate: In the palace at Chichen-Itza there is a massive shaft which is surmounted by a heavy block placed under the massive roof, which projects from the palace. On this column are inscribed the head and body of a serpent, the very scales of the serpent forming an elaborate ornamentation. Certainly no such shaft as this would have been erected unless the builders had passed beyond the primitive stages. The column fills its legitimate office, it supports a heavy roof. It is highly ornamental, suggestive of a high grade of art. It also has a capital similar to that of the Proto-Doric, the three elements in one—support, form, ornamentation, resembling the columns of the Old World when in an advanced stage. Such columns did not appear in Assyria until the reign of Esarhaddon. Such columns did not appear in Egypt till the reign of Rameses II. We may say then that the architecture of the civilized races in America was equal in many of its qualities to that of the civilized races of Assyria, Egypt and Phœnicia; that it was similar to that which appeared in the middle period of the ancient dynasties, and that it indicated a civilization which was remarkable in such an isolated region and among people who had been for so long unknown.

The column is, then, by its very appearance in America, an indication that architecture had passed beyond the primitive stages, and that a very considerable degree of civilization had been reached.

*See Bancroft's *Native Races of the Pacific States*, Vol. IV., pp. 214, 217, 275.

CHAPTER XV.

ANCIENT TEMPLE ARCHITECTURE.

We have now passed in review the different structures which appeared in pre-historic times and continued into the historic, and have found that each one of them originated in a very primitive form, but came up through different stages until a high degree of perfection was reached. This has proved to be true of such common objects as the bridges, boats, and other mechanical contrivances, but especially true of the houses, forts, palaces, and all other forms of architecture, whether representing naval, military, domestic, funeral or sacred. There is, however, one class of structures into which other elements besides the ordinary mechanical and architectural principles have entered, namely, the Temples: for in these the religious sentiment has proved a very important factor, and has had as much to do with their growth as even the architectural or mechanical principles. We shall, therefore, take for the subject of the present chapter, The Early or Ancient Temples of the World, and seek to find out their origin and to trace the lines of their development and see what causes have been at work to bring them into such a variety as they have presented. In doing so, we shall assume that there were, at the beginning, certain primordial forms from which all architecture started, and that these forms continued to impress themselves upon the temple architecture when it arose, so that we have even now different kinds of temples which may be classified according to the type after which they were patterned. They may be classed as follows: 1. Temples in Caves. 2. Open Air Temples. 3. Temples in the form of a tent. 4. Temples in the form of a round hut. 5. The Temple in the form of a square tower called a teocalli. 6. The Temple or Shrine situated upon the summit of a pyramid. 7. The Temple in the form of a house but built in the columnar style.

1. In reference to the cave temple, it will be understood that this was different from the ordinary cave dwelling, and yet was the outgrowth of the habit or custom of living in caves.

There are caves in the West Indies which were used as shrines for their divinities or idols. These caves contained many religious symbols, wrought into etchings and grotesque images or idols. It is a belief among the Antilles that all the human race emerged from the same cave, but after their advent upon the earth's surface they assumed the forms of various animals. Idols were discovered by Columbus. These were called Zemes. They are supernatural beings embodied in images of stone. They are supposed to be representatives of the "Clan Ancients," each individual Zeme representing a supernatural divinity.

It is well known that the oracles and temples of Greece and other ancient countries were either in caves or remote mountain recesses. The temples of Pan, Bacchus, and Pluto were in caves, as well as the oracles at Delphi, Corinth, and Mount Cithæron. In Persian mythology caves were the places where the rites of mithras were observed. In Europe there were caves about which myths have gathered, such as the Fairy Dragons or Devil's Cave and Dwarf Holes. Caves were also used for burial places, and so became shrines and sacred places. The cave of Macpelah is well known as the burial place of the household of Abraham.

In America, caves were used as the homes of the people, and became sacred places. Among the Cliff-Dwellers, there were whole villages built into the shelter caves, but the most prominent building in them was the so-called Kiva. This presented the shape of a primitive hut, built in circular shape with the walls divided into ledges and piers, which are supposed to represent the posts and walls of the primitive hut, and at the same time, symbolize the pillars of the sky, the conical roof symbolizing the dome of the sky, and the hole in the floor symbolizing the place of emergence through which the ancestors came from their primitive home. The Pueblos built their kivas under the ground, and reached them by ladders, but made them represent both the cave and the hut.

In Mexico, and Central America, there were underground caves which were used for the sacred ceremonies that were performed. Dr. Brinton has described the nagualism or witchcraft which found lodgment in caves, and which reminds us of the witchcraft that was practiced in the time of Solomon by the witch of Endor, whose home was in a cave.

The cave became so sacred that labyrinths were constructed to imitate them. The labyrinth of Egypt is well known. It consisted of many chambers, the most of them below the ground, the subterranean rooms being sacred places. A labyrinth has been recently discovered in Crete. The most magnificent works of art were contained in it, and some fine specimens of architecture, thus carrying back the date of civilization in Crete to a marvelous antiquity. The labyrinth called "Lost and Lost," (Tzatum Tsat.) in Nicaragua, was also a sacred place which imitated the cave. The following is a description of it by Mr. H. C. Mercer:

"The whole was covered by an artificial mound of stones, oblong in shape, 350 feet in circumference, and 31 feet high. Within, there are three tiers of flat stones, and the stair case leads from the innermost passage of the lower story to the upper story."

The cave of Loltun, near Palenque, has also been described by Mr. Mercer:

"A great rotunda, 320 feet long, 250 feet in diameter, led to a chamber under the sky light. The rocks were covered with symbols and pictures of a mysterious character. The question arose 'had the rocks seen the

diabolic rites of Nagualism?' or had men ventured to live here day and night, burying their dead here, and wandering into the unknown?"

It is to be noticed that the rock cut temples of India, were shrines as well as temples, but they presented, on the outside, carvings which represented the earliest columns, beams, posts, doorways, rafters of the earliest temples constructed of wood, and, at the same time, the statues of the Divinities were preserved in the shrines, but all carved out of stone.

The ancient Etruscans, built their temples partly beneath the surface, but the upper part was built in the form of a house, with arched roof and pillars in front, and a ledge which formed a seat around the sides. The tomb of Cyrus was in the form of a house, but the front was open, thus making it into a shrine. The tombs in the valley of the Kedron opposite Jerusalem, were grottoes cut out of the rock, but resembled houses or temples on a small scale. The tomb of Absalom, is a good specimen of this. It is ornamented with Ionic pilasters, surmounted by a circular cone of masonry which terminates in a tuft of palm leaves.

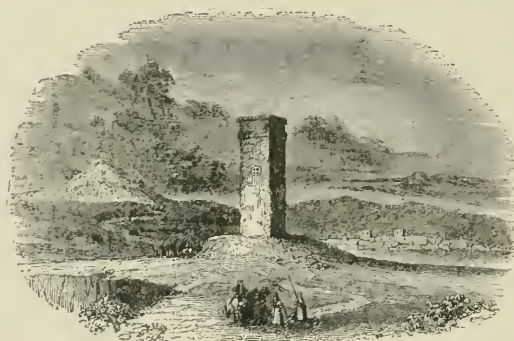
It was in connection with the cave temple that the earliest forms of architecture appeared. The column, in its different stages of growth, is shown by the cave at Beni Hassen, in Egypt, and the facade, or, portals, with the accompanying statues, as shown in the rock cut temple at Abou Simbel. Within this tomb, or grotto, are seen two groups of statues, and, upon the roof, may be seen the winged circle. The tomb of Mugheir, on the other hand, presents one of the earliest forms of the arch, though it is made by horizontal projections of the bricks and without the key-stones, and thus resembles the arch as it is found in America. There is a relief from Korsabad which represents a temple with its interior open to view, and on either side may be seen the castle with battlements; also, the rock cut tomb of Darius, represents a palace with columns and cornice and doorway all in the Persian style.

II. Open air temples are to be treated next. These were constructed in different ways and had a great variety of forms. Among these forms the following may be mentioned: 1. The Monoliths or Obelisks. 2. The Circle of Standing Stones, which are so common throughout the far east and the various parts of Europe. 3. The high places which are so numerous in various parts of Syria, Arabia, and the land of the Hittites, 4. The various altars which were common in the same region but were disconnected from temples and yet were sacred places. 5. The altars which are connected with sculptured statues and idol pillars generally called Stelæ which were common both in Babylonia and other parts of Asia and in Central America. 6. The sacred groves common in India, Greece and Great Britain. 7. The slab circle with the altar enclosed found at Mycenæ.

Open air Temples were very ancient, and, perhaps, follow-

ed the caves in the order of time. These, for the most part, were in the form of circles, sometimes consisting of earthworks with openings for the processions which might enter them, but generally were made of monoliths, which were erected either in the form of a circle or an ellipse or a horseshoe. Monoliths were common throughout the East. The majority of them were erected to commemorate some noted event, illustrations of which are found in the scriptures, for Jacob erected a pillar which should be a sign of his vow as well as a reminder of his vision. The obelisks of Egypt, may be called monoliths rather than temples, for they are commemorative monuments, and contain the records of various kings. The obelisk at Nimrud* is also a monument, as it was designed to commemorate the victory of the king over his enemies.

Obelisks were frequently placed near temples, and so may well be considered in connection with temple architecture. Two rock cut obelisks at Mazzebah, near Petra,



OBELISK IN MOAB.

with a round and square altar, and a rock cut court have been discovered. These obelisks probably grew out of standing stones; or a modification of them, and suggest the thought that the standing stones and alignments, in the north of France, were connected

with some form of worship, marking out the avenues through which the processions might be led to the tombs, as elsewhere, in Great Britain, they led to open air temples.

That standing stones and obelisks were connected with open air temples, will be seen as we proceed, for they are found not only at Stone-henge and Avebury, but also in Peru, and many other parts of the world. There were isolated columns forming the circles around the ancient tombs in India, and many other parts of the East.

As to the question whether there were open air temples in America, it would seem that there were, for nearly all of the religious ceremonies of the aborigines were in the open air. The people of the Great Plateau timed their ceremonies by the position of the sun by day and the Pleiades by night, the study of the heavens being as close with them as among the

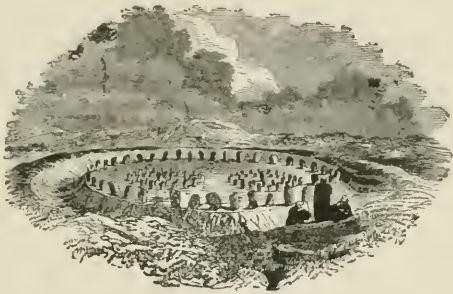
peoples of the East, and the dependence upon the powers of the air was as great among them as the dependence upon the rising of the waters was among the people dwelling upon the Euphrates or the Nile.

The circle, or round temple, seems to have been at one time the place where laws were enacted. In Ireland the Moot Hills are usually on the margin of a river, in the immediate vicinity of a religious edifice, forming an interesting object in the landscape.

Sir James Logan says:

"In Scotland, the Highlanders were accustomed to assemble and elect chiefs, the clans having their special place in the circle. Clanship involves open air assemblies both for the military and religious purposes. When the Highland chief entered on his government, he was placed on the top of a cairn, and around him stood his friends and followers. The practice of crowning a king upon a stone is of extreme antiquity and survives to the present day in England. The practice of holding courts in the open air was common. The court of Areopagus, at Athens, sat in the open air. The same practice was common among the Druids, but on the abolition of Druidism the courts which were held in the circles, were transferred to the church. The sacrifice of captives was considered, in some cases, as necessary for propitiating the deity."*

The question arises, in reference to the connection of the standing stones with the circles, and the object of the circles. There are many reasons for believing that the larger circles were designed for temples. Among these are the following: 1. Many of the circles contain within them dolmens, which were used both for burial places and for altars, suggesting that human sacrifices may have been practiced. 2. The fact that there are ring marks and cups upon some of the dolmens, suggests the idea that blood was poured out and was preserved in the cups. 3. Circles formed of standing stones are frequently isolated from the surrounding country by small bodies of water, or upon hill tops. 4. The fact that earthwalls surrounded the stone circles and that avenues led to the interior suggests that they were used for religious ceremonies and processions. 5. The symbolism contained in the stone circles suggests that the enclosures were sacred to the sun and the circles were symbols



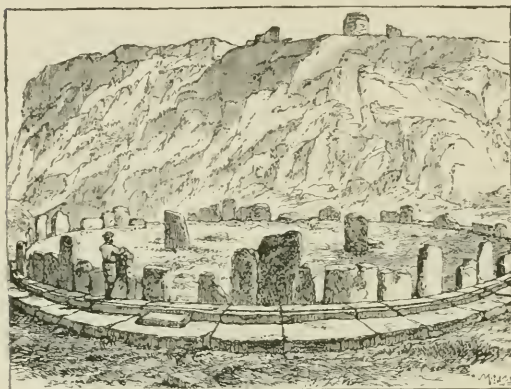
OPEN AIR TEMPLE AT AVEBURY.

The circle of standing stones at Avebury shows probably an open air temple. The cut so represents it, for Druid priests are seen in it, loitering about the walls and treading the enclosed ditch.

*See Scottish Gael or Celts Manner, by James Logan, 1843

of the solar cult. 6. The standing stones or menhirs, were often placed in such a position as to throw a shadow into the circle. This confirms the idea still further, and makes it probable that there were solstitial ceremonies observed in these circles resembling those in the ancient temples farther East in Egypt, Assyria, India, and in America. 7. The color, and character of the stones, especially those of Stone-henge, are very significant, and show that symbolism extended even to the material as well as to the arrangement of the stones.

This generalizing does not prove that all circles were open air temples, nor does it prove that there was any connection between the open air temples and other temples which appeared in other parts of the world, and yet this as well as the fact that temples and tombs were always closely associated, and that



OPEN AIR TEMPLE IN PERU.

the sky and earth were regarded as the different parts of the Great Temple, renders it probable that the circles were not only symbols, but were sanctuaries in which the solar divinities were worshiped.

There were open air temples in America. The one represented in the cut is in Peru. It was devoted

to sun worship. It symbolized the sun, as the stone pavement was laid in diagonal lines, the temenos was marked by a circle of standing stones, while two standing stones in the center showed the exact time of the equinoxes, as they cast no shadow when the sun was at the equinox.

The best specimens of open air temples are those of Stone-henge and Avebury in Great Britain. These have already been described, but as there are certain features which have been omitted, we shall again refer to them, drawing especially from the English authors.

The following is Barclay's description of Stone-henge:

"It is enclosed by a low circular embankment outside a ditch, named the 'Earth Circle,' To the northeast is the ancient avenue where are the two outlying stones; The 'Friars Heel' that bows toward the temple, and the 'Slaughter Stone' that lies flat with the ground between the Sun stone and the temple. The design consists of an outer circle of thirty uprights

*The color of the stones, white and blue, reminds us of the symbolism of color which was common among the American aborigines.

supporting twenty-eight transverse lintels; within this circle, a smaller circle of uprights. These circles contain two horseshoe figures, one within the other. The outer horseshoe, is composed of five groups, consisting of two piers, and a superimposed block. The inner horseshoe, is composed of small uprights. Both horseshoes had their openings toward the Sun stone. The outer lintel circle and outer horseshoe are composed of Sarsen stones brought from near Avebury; the inner circle and inner horseshoe are composed of blue stones of igneous rock brought from a distance.

The analogues of Stone-henge, were found by Palgrave in Central Arabia, by Barth near Tripoli, in Africa, consisting of triliths and stone circles, a sort of sun dial, combining the vertical and horizontal principle. The flat stone was intended to carry off the blood of the victim.

Stone-henge consists of different kinds of stone, but was probably erected at one time, and has a unity of design in the measurement of different parts. Parts of the chippings of the stone, are found in the barrows. The cursus was an appendage of the temple and was constructed at the same time.

The triliths distinguish Stone-henge from other circles. The distance from the Sun stone to the Slaughter stone, is one hundred feet. The placing of the Slaughter stones, the Sun stones, the Stones of the earth circle in regard to the center, the diameter of the Sarsen circle, and of the blue stone circle, the distance of the central trilith, the depth of the horseshoe, and the dimensions of the altar, are all derived from the triangle within the circle.

The symbols of Stone-henge, are found in many things; the circle is a symbol of the sun; the crescent or the horseshoe, is the symbol of the moon; the triliths are mystic gateways; the long avenues were designed to be the paths of religious processions; other symbols are found in the color of the stone, the blue stone and the red stone.

We have two forms of worship symbolized at Stone-henge; the earth worship and the sun worship. The bond of union in the primitive household was the domestic worship. As the house father made the offerings to the house spirit, the fire, by throwing a share of the food into the fire before eating; in the circular temples was involved the worship of the sun, the visible world father. Men prayed to the sun, the Ruler, and Saviour of the world to give them good harvest and daily bread.

From the position of the altar table, in the circle, we perceive that any object placed on it should be at the mid-summer sun-rise, when the sun would cast its shadow on the trilith.

As the sun rose the shadow of the lintel circle covered the altar table, but when the portals of the east, the everlasting gates, were thrown wide open and the sun god shone out in the fullness of his glory, then it appeared that he regarded the sacrifices with favor, and wrote upon the wall with his sunbeams the golden rule, his assurance of plenty.

Barclay says, further:

"When standing within the precincts of this heavy or shattered temple, the spectator is forced to acknowledge that the unknown designer, has succeeded in conveying a remarkable impression of grandeur simplicity of design, bold and rugged objects with no attempt at ornament. These rocks strike one with a sense of endless endurance and power, while order and dignity assert themselves amid this wreck and confusion."

III. The temple, in the form of a Tent, is the most common, and, at the same time, the most interesting. We learn from the Sacred Scriptures, that the Tent was regarded as the home of the divinity, and, that it was sacred to the Hearth Divinity. This is illustrated in the case of Abraham. When the angel visited him, a sacrifice was made, and the pieces of sacrifice, according to the common custom, were divided, but

Abraham dreamed that he saw the furniture of his tent, such as the smoking furnace and the burning lamp, passing between the pieces, and he took it as a sign that the hearth divinity had accepted the sacrifice, and had even made sacred the common furniture.

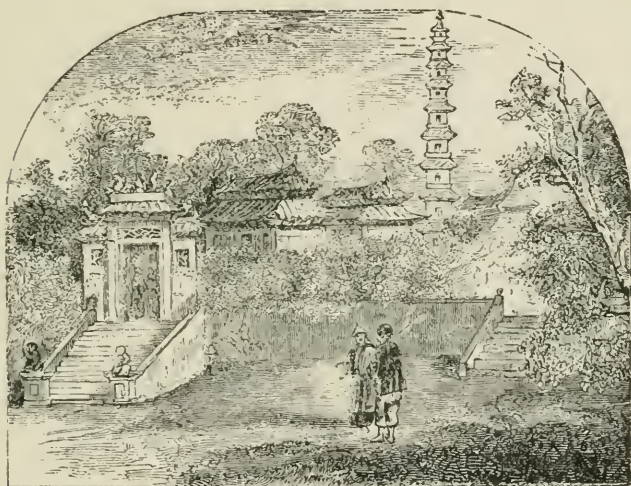
It was perfectly natural that the temple should become a shrine or temple, for the most sacred associations of life were connected with it. The children of Israel, when they passed through the wilderness, are said to have received a command from God, as to the place in which he was to be worshiped. It was in the tabernacle or tent resembling those of the common people, and its furnishings were reminders of those of the home, the table, upon one side, the candle stick upon the other, the laver at one end, and the curtain at the other, the Holy of Holies beyond the curtain, and the ark of the covenant within the curtain.

Every portion of this tabernacle, reminds us of the Patriarchy which prevailed at the time, and furnishes a picture of the home life of the people, for the tabernacle was gold lined, and yet was in the form of a tent. The table with the sacred loaves upon it, and the golden candlestick, also represented the common furniture of the house; the ark within the Holy Place represented the chest, which contained the treasures of the household; the sacredness of the place also suggesting the privacy of the house, and the authority of the father. So sacred was the house in these days that it was imitated by the tomb, and the tomb became not only the house of the dead, but the place of worship and sacred assemblies. In fact the tomb became a temple, and remained such for many centuries, even among the more civilized people, and into historic times. It is supposed by some, that the worship of ancestors which was one of the earliest forms of religion, was perpetuated by this means, but the tomb continued to be a temple or place of worship long after the worship of ancestors ceased.

The enquiry has arisen as to the original form of the tabernacle. Was it in the form of a tent resembling the other tents in which the Israelites dwelt or was it in the form of the oblong house with upright walls resembling the Egyptian temple? On this point there is considerable uncertainty. It is known that the Egyptian temple was made up of several parts. In front of it were the propylæ or lofty gateways. Next to this was the Peristyle hall back of this was the Hypostyle hall in the rear of all was the Adytum. The tabernacle had a court in front of it which was entered through a single gateway and was called the Temple Court and was the place of sacrifice. Within the tabernacle proper was the Holy Place which corresponded to the Hypostyle Hall, while the Holy of Holies corresponded to the Adytum of the Egyptian and no one could enter it except the high priest.

The Temple of Solomon was modelled partly after the or-

iginal tabernacle but contained features which resembled those of the Assyrian and Babylonian rather than the Egyptian temple. Several features, however, seem to have been borrowed from the Egyptians. First there were two pillars in front of it which resembled the obelisks in front of the temples in Egypt. Second the pillars or columns of Solomon's court were all on the inside making it resemble the Egyptian temple rather than the Greek temple. Third, the tabernacle as well as the temple of Solomon was but a single story in height and in this respect resembled the Egyptian rather than the Babylonian, for the latter was always three stories in height and ultimately reached the seventh story. Each story or terrace was devoted to a separate Stellar divinity, the upper story devoted to the sun. Fourth, the tabernacle as well as the temple was divided



SHINTOO TEMPLES AND BUDDHIST TOWERS.

into three parts, the court, which was open to the people, the Holy Place which was open only to the priests, the Holy of Holies which was open only to the high priest once a year, and contained the ark and figures of angels; a division which corresponded to the Peristyle, Hypostyle, and Adytum of the Egyptians. Fifth, the form of angels with wings in the Holy of Holies corresponded to the winged figures of the Babylonians, though the Babylonian figures had six wings. There was a difference, however, between the winged figures of the tabernacle and those in the temple for in the tabernacle the winged figures were kneeling and both wings were thrown forward, but in the temple the winged figures were standing and the wings stretched out to either side, reaching the walls on one side and meeting one another over the ark on the other side and so

over shadowing the ark. Sixth, the names of the temples of the different nations are significant. In Babylonia the temple is called Mountain House or the Lofty House. In Egypt it is called the Great House or the King's House, and is equivalent to the palace. In Jerusalem it is called the House of Yahveh or God's Dwelling Place and the Holy Place.

Seventh, the personal element prevailed in the temple of the Jews, but the worship of the sky and heavenly bodies prevailed in Babylonia. In Egypt it was the worship of animals, of ancestors, of kings, and of the personified nature powers, the most of them represented under human forms but with animal heads. No such distorted images were ever seen in the Tabernacle or temple and the only image seen was suggestive of angelic creatures and typical of the heavenly scenes.

The Hebrew temple had two forms—that of the tabernacle in the wilderness and Solomon's temple at Jerusalem, each of which was built after a different model and embodied a different style. The Babylonians seem to have retained in the tower like form of their temple the reminiscences of their earliest home among the mountains, for, notwithstanding the fact that they long lived on the level plains near the mouth of the Tigris, they always built their temple in the form of a lofty tower and called it the Mountain House or the House of the Mountain Divinity. They, however, changed the significance of the tower and made it symbolize the pillars of the sky, but dedicated it to the planets and the sun, and gave each story a different color so as to represent the various planets. The shrine upon the summit was consecrated to the sun.

There were other nations beside the Hebrews who built their early temples in the shape of tents. Among these the most notable are the Hindoos and Chinese. The Chinese had two kinds, one devoted to the Shintoo faith and the other to Buddhism, but both retained the tent form. See cut.

The Buddhist temples have taken the place largely of the Shintoo temples. In them we see a marvellous grouping of buildings with a two-storied gable as chief feature, which resembles a gate. The framing of the lower story is arranged so as to form niches in which stand the God. The roof is the most artistic feature, having broad, overhanging eaves, festooned in the centre and bent upward and backward at the corners. Buddhist temples, like the Shintoo temples, are composed of buildings grouped together. Passing through the entrance, the visitor finds himself in the first terraced court, only to encounter another, and so on to a third and fourth. After traversing terrace after terrace he reaches the chapel or oratory. The court yards are usually filled with buildings of the Buddhist cult, as well as a number of bronze lanterns.

Belfreys, priest apartments, pavilions, with cisterns of holy water, and pagodas appear on every side, all crowned with festooned roofs. Among the most imposing of these are pagodas which are invariably square. Externally the pagoda is built in five or seven stories, each set a little back of the other, and girt about with balconies and overhanging eaves. The whole is usually lacquered, and above all, is the spire of bronze which forms the peak.

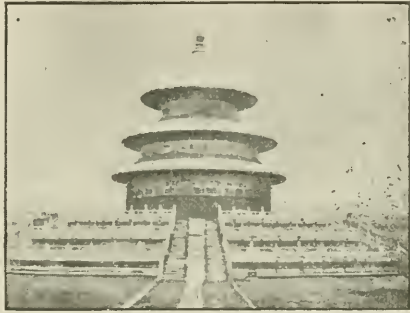
The temple, like the domestic buildings, is provided with a verandah and columns, shaded by a gabled roof, and a bracketed cornice. The floor is covered with silk-bordered mats. The roofs, like festooned, jewelled

mantles, are graceful in curve and sweep. The Japanese never mistake greatness or ostentation for beauty, but they always exhibit refinement and reserve, which contribute so much to the ideal.

The origin of these styles of the Oriental temples came from the tendency to make the house resemble the tent, and to cover it with adornments of sculpture, which so easily won their fancy and engaged their skill. In this respect their art and literature were alike.*

IV. Another pattern is found in the Chinese temples. These are in the shape of a round hut, with a conical roof, and sometimes several roofs. They are probably survivals of the primitive house. They are described by Rev. Henry Blodget D.D.:

† "The state worship of the early kings of Egypt, Greece, Rome, Phœnicia, Assyria, Babylonia, and India, no longer exists in real life. If we study it, we do so from books, and from the monuments of antiquity; but here we have the ancient worship of China, preserved in a living form, to the present time. This worship is invested with the deepest interest to students of ethnic religions. The antiquity of its observance; the magnificence of its altars; the imposing nature of its rites; combine to give this worship a very conspicuous place in the study of the ancient nations.

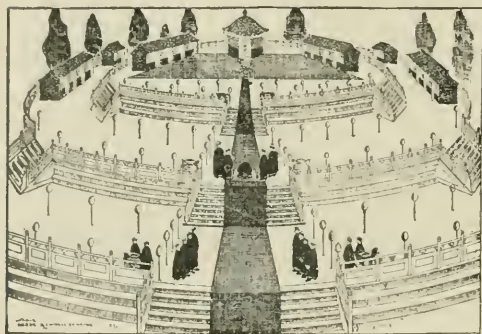


CHINESE TEMPLE.

The dual principle was recognized in China, one called *yin* and the other *yang*, and there were two altars in the city of Peking. The one directed to heaven, which is also *yang*, is on the south; the altar to earth, which is *yin*, is on the north, but the altar of the sun is on the east, and the altar of the moon on the west. Each of these altars, is situated in a large park, planted with rows of lotus, pine and fir trees. The south is the region of light and heat, the *yang*, while the north is the region of cold and darkness, the *yin*. This perpetuates the myth, which surrounds the altar to heaven, which has the greatest antiquity and importance. This altar is built of white marble, and stands under the open sky. The structure is in three concentric circular terraces, rising one above another, and each surrounded by richly carved marble balustrades. The diameter of the lowest terrace is 210 feet, the middle terrace 150 feet, the uppermost terrace 90 feet. The last is a circular flat surface about 18 feet above the level of the ground. It is paved with white marble slabs, which are so arranged as to form nine concentric circles around one circular stone in the centre. The altar is round, as representing the circle of heaven. It is built of white

*Overland Monthly. †Jour. of Amer. Oriental Society, 1902.

marble, rather than of dark, because heaven belongs to light, or the *yang* principle. The ascent to the altar, is by three flights of steps, on the north, the south, the east, the west; each flight having nine steps. Answering in all respects to the altar of heaven, is the altar of earth, on the north side of the city. The grounds of this park are square, and contain about three hundred acres. The altar to earth is made of dark colored marble, since the earth belongs to *yin*, the dark principle. It has two terraces, instead of three. The top of the altar is paved with marble slabs, quadrangular in form, and laid in squares, around a central square, upon which the emperor kneels and worships. Each of these squares, consists of successive multiples of eight instead of nine as in the circles on the altar to heaven. It is built upon a square elevation, surrounded by a square wall, while the altar to heaven is built upon a round elevation, and surrounded by a round wall. The altars to the sun and moon are constructed on the same general plan, with constant regard to the



CHINESE TEMPLE AND STAIRWAYS.

dual principle, as are the altars of the gods of the land and grain, the spirits of heaven, the spirits of earth, all of which are in the *yin*, as all worship is arranged according to the dual principle, *yin* and *yang*. The worship of heaven comes at the winter solstice, because then the power of the *yin*, or dark principle, has run its course, and is ex-

hausted, and the power of the *yang*, or light principle, represented by heaven, again begins to assert itself. The days begin to lengthen; nature prepares herself once more for the glories of spring and summer.

The worship of earth comes at the summer solstice. Then the power of the *yang*, or light principle, is exhausted, and the power of the *yin*, or dark principle, represented by earth, begins in turn to assert itself. The days begin to grow shorter.

This solstitial worship, as it is most ancient, so also is it sacred in the regard of the Chinese. No one but the emperor or one of the highest rank, delegated by him, is allowed to perform it. Acknowledging its great authority, every one would recognize the fact that, it is invested with a high degree of reverence and solemnity; the religious feelings are deeply moved in performing its sacred rites; that there is a certain elevation of mind, a grandeur and awe, which attaches to the worship of

the vast heaven and broad earth, the sum total of all created things, performed, as it is, by the monarch of so many millions of human beings.

The worship of heaven and earth, stands at the head of the Chinese pantheon, and is inseparably bound up with the worship of numerous other beings and things. The pantheon of China is large. It includes the various parts and powers of nature; the deceased emperors of every dynasty; deceased sages, heroes and warriors; distinguished statesmen; inventors of useful arts; in general, an under world made up of all objects of worship in the three great religions of the land.

V. In America there were several kinds of temples, one circular in shape, resembling the round hut, another in the shape of a square tower, called a teocalli, and the third in the form of a shrine, all placed upon pyramids.

To illustrate, there are round towers in Mexico and Central America, which are called Caracols. These are conical in shape, and have stairways in the interior, and a conical roof surmounting them. They are placed upon a conical pyramid, which has stairways, pointing to the four quarters of the earth, and are furnished with doorways connecting with the stairways. It is not known from what source this symbolism was derived, but it seems to have been connected with the worship of the nature powers.



CHINESE PAGODA.

Temples are to be distinguished from towers. There were temples connected with palaces, as can be seen from examining the plates, which represent the ruins of Palenque, Uxmal, Chichen-Itza, Xkichmook; that there were also towers connected with the temples, is shown by the accounts written by the various historians. To illustrate: De Solis, in describing the conquest of Mexico, speaks of a rising ground that commanded the whole circumjacent plain, on the top of which, was a towered building which appeared like a fortress. It was a temple dedicated to the sylvan deities or idols of the woods, to which those barbarians dedicated their harvests. The court of the temple was sufficiently capacious, encompassed with a wall, after their manner of building, which, together with the

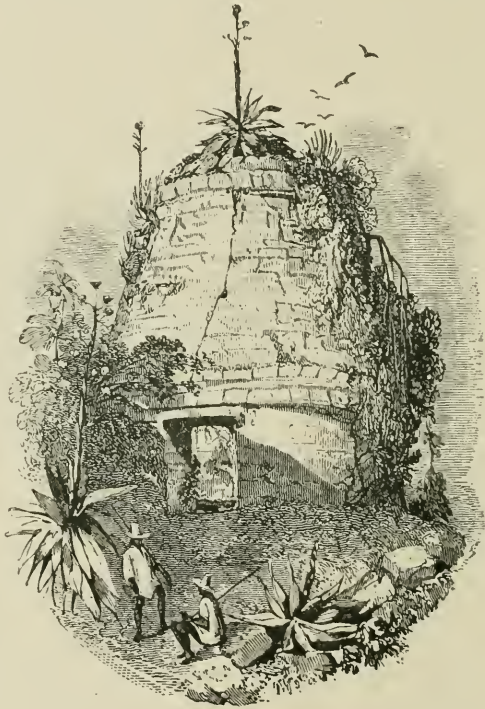
towers, by which it was flanked, rendered it tolerably defensible.*

These towers were generally arranged on the sides of enclosures and, in connection with entrances to the temples, but some of them, were at the foot of the pyramid on which the temples were placed. De Solis, speaks again of the towers of the great temples, which could command a part of the palace and of others connected with the temple itself. He says: "The ascent to the upper gallery to the temple, was by a hundred steps upon the pavement, whereof some tolerably large towers were erected. In this they had lodged about five hundred men, chosen out of the Mexican nobility, and were so fully bent upon maintaining it, that they had provided themselves with arms, ammunition, and all other necessities for many days."

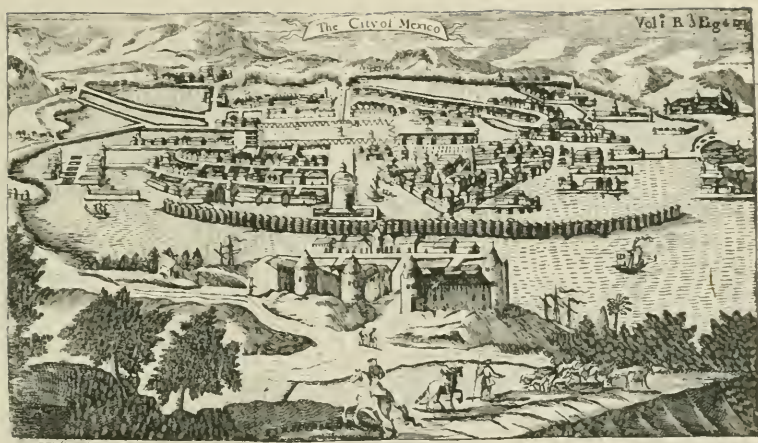
Gomara, speaking of the various towns which were planted in the middle of the lake, says: "They are adorned with many temples, which have many fayre towers that beautify, exceedingly, the lake."

In speaking of the city of Mexico, and the towers which abound in the city, he says: "Upon the causeway are many draw bridges built upon arches that the water passes through.

The strength of every town is the temple, which is built with a pyramid and stairs, and towers upon the summit. Besides the palaces, which stand upon the pyramid, there are lofty towers. The great temple occupied the centre of the city. The wall about the temple, was built of stone and lime, and very thick, eight feet high, and covered with battlements ornamented with strange figures, in the shape of serpents. It had four gates to the cardinal points, correspond-



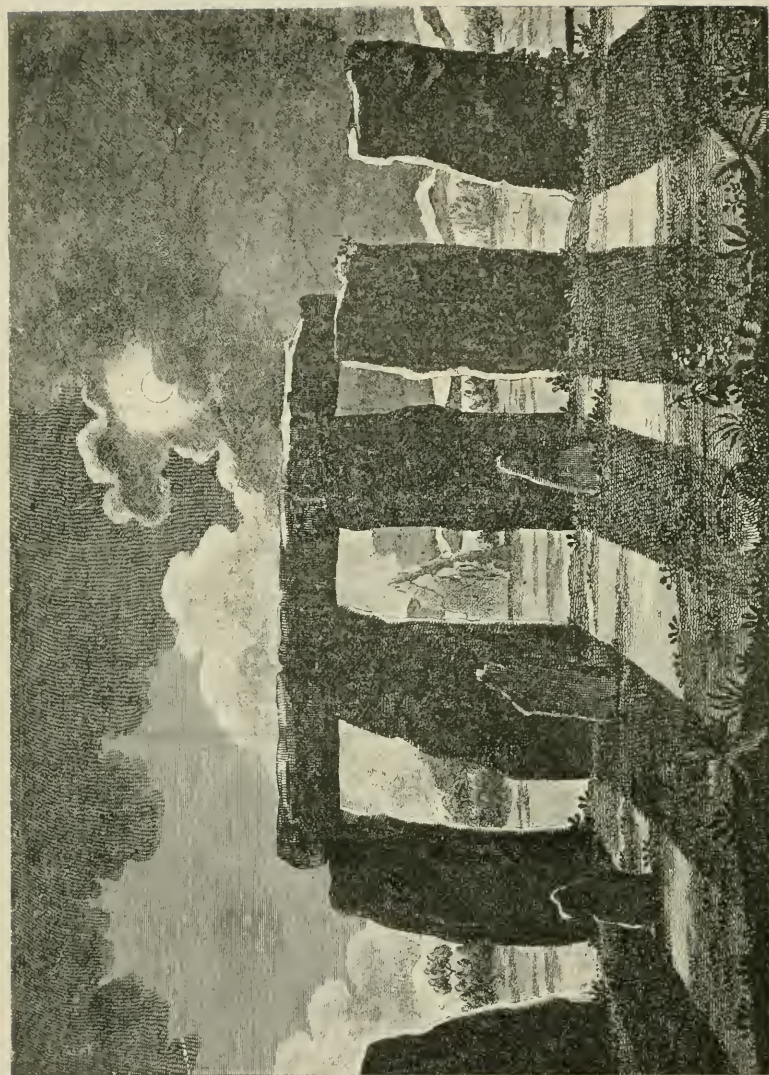
CARACOL AT MAYAPAN.



THE CITY OF MEXICO AS REBUILT BY THE SPANIARDS.



ANCIENT TEOCALLI IN THE CITY OF MEXICO.



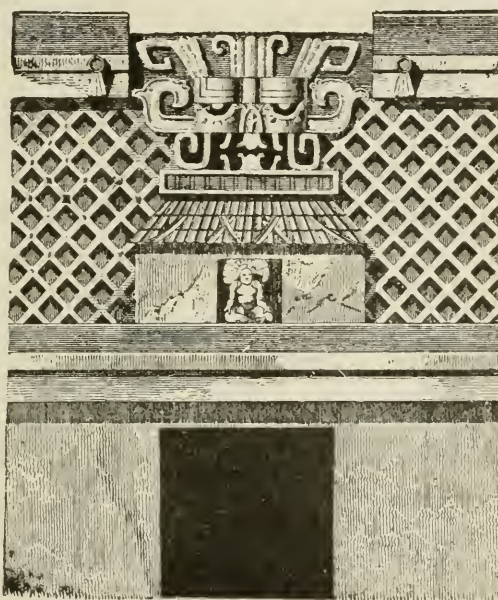
STONE-HENGE BY MOONLIGHT.

ing to the streets, the broadest and longest of which, led to Iztaclopoca, Tacuba, and Tezcucó. Over each of the gates was an arsenal filled with a vast quantity of weapons. The space within the temple wall was paved with very smooth stones, in the middle was raised an immense solid building of greater length than width. This building consisted of five stages. The lowest was more than fifty perches long, and forty-three perches broad; the second and third about a perch less, so that upon each there remained a free space which would allow three or four men to walk abreast, with as many separate stair-cases. The height of the building, without the towers, was eighteen perches, and, with the towers, twenty-eight perches. From the height one might see the lake and the cities around.

As to the city of Mexico, it is well known that there were, at the time of the conquest by Cortez, many temples, which were called Teocalli. These were in the form of pyramids which stood in the centre of an enclosure, and were surrounded by a number of shrines or smaller temples.

The following is De Solis' description of the Great Temple or Teocalli which is situated in the center of Mexico, and is represented by the plate, but incorrectly:

The first part of the building was a great square with a wall of hewn stone; wrought on the outside with the various knots of serpents intertwisted, which gave a horror to the portico and were not improperly placed. At a little distance from the principal gate was a place of worship that was terrible. It was built of stone, with thirty steps of the same, which went up to the top, which was a kind of long flat roof, and a great many trunks of well grown trees fixed in it in a row, with holes bored in



SYMBOLIC HUT AND MANITOU FACE.

Of the two plates, one represents the temple or Teocalli, described by De Solis, the other represents the cathedral, forts and houses erected by the Spaniards after Cortez had destroyed the first city and laid in ruins the various temples which were scattered through it. The figures over the gateways of the old temple do not properly represent the originals for these were wrought out of solid stone and were covered with hideous serpents' fangs and tails and a ghastly skull in the center, the whole presenting a terrifying appearance.

them at equal distances and through which from one to another passed several bars run through the heads of men who had been sacrificed. The four sides of the square had as many gates opening to the four winds. Over each of these gates were four statues of stone which seemed to point the way, as if they were desirous of sending back such as approached with an ill disposition of mind. These were presumed to be threshold gods, because they had some reverences paid them at the entrance. Close to the inside of the wall were the habitations of the priests, and of those who, under them, attended the services of the temple with some offices which altogether took up the whole circumference within, retrenching so much from that vast square that but eight or ten thousand persons had sufficient room to dance in upon their solemn festivals. In the center of this square stood a pile of stones, which in the open air exalted, its lofty head overlooking all the towers of the city; gradually diminishing till it formed a pyramid; three of its sides were smooth; the fourth had stairs wrought in the stone; a sumptuous building and extremely well proportioned. It was so high that the stair-case contained a hundred and twenty steps, and of so large a compass that on the top it terminated in a flat forty foot square. The pavement was beautifully laid with Jasper stones of all colors. The rails which went round in nature of a balustrade, were of a serpentine form and both sides covered with stones resembling jet, placed in good order and joined with white and red cement, which was a very great ornament to the building. There were other places where similar temples were situated the remains of which are still standing.

Various authors have spoken of the Teocalli of Mexico, Humboldt says:

"The construction of the Teocalli recalls the oldest monuments which the history of the civilized race reaches.

The temple of Jupiter, the pyramids of Meidoum, and the group of Sakkarah in Egypt, were also immense heaps of bricks; the remaining of which have been preserved during a period of thirty centuries, down to our day."

Bancroft says: "The historical annals of aboriginal times confirmed by the Spanish records of the conquest, leave no doubt that the chief object of the pyramid was to support a temple; the discovery of a tomb with human remains may indicate that it served also for burial purposes. These temples have disappeared along with the palaces and private houses, and scarcely a building remains to remind us of the condition of the city as it was seen by the Spaniards.

The principle monuments of Mexico, the Calendar Stone, the so-called Sacrificial Stone, and the Idol, called Teoyaomiqui, were all dug up in the Plaza, where the great Teocalli is supposed to have stood, and where they were doubtless thrown down, and buried from the sight of the natives at the time of the conquest."

There are, however, localities not far from the city, which retain a few vestiges and remains of the ancient temples. Among them may be mentioned the city which, at the time of the conquest, stood out boldly in the midst of the waters of the lake, and were connected with the central city, and the shores, by the famous causeway or dyke over which the Spaniards retreated.

Among these may be mentioned Tezcuco, the ancient rival of Mexico. This city yet presents traces of her aboriginal architectural structures. In the southern part are the foundations of several large pyramids. Tylor found traces of two large Teocallis.

These Teocallis were common in Mexico and suggest the

cruel practices of the Aztecs. They were furnished with sacrificial stones and were places in which human sacrifices were offered to the sun.

In these sacrifices the victim was stretched upon the stone and his heart torn out and offered to the sun, but his body was hurled down the steps of the pyramid and afterward devoured by the people.

On the contrary, the temples of the Mayas of Central America were furnished with tablets and sculptured figures which were suggestive only of peaceable scenes, and a mild and kindly religion.

We may say of these temples that they differed from those of the old world, though the pyramid seems to have served as the foundations for all.

An illustration of this will be seen in the cut, which represents the different forms of temples in the Eastern continent the Egyptian, the Assyrian, the Tibetan and Scandinavian, all of which were of pyramidal style.



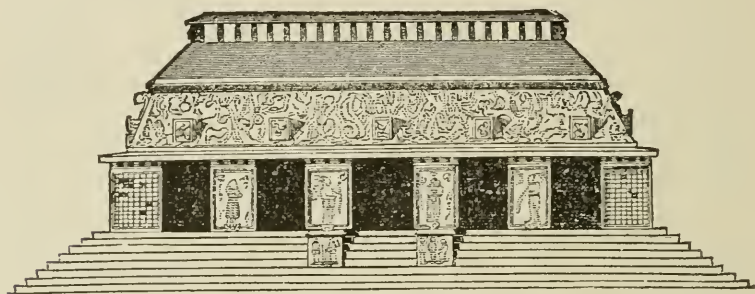
PRIMITIVE TEMPLES IN THE OLD WORLD,

There were, to be sure, shrines in Babylonia, some of them situated high up in the sides of the rocks, with columns and figures, and inscriptions in front of them; others, on the summit of pyramids or towers. There were shrines among the rock cut temples of India, and the most of them contained images of the personal divinities, those of Brahma, Siva, Vishnu, and Indra. In China, shrines are often found in the Pagodas and are surrounded by a court which is filled with images.

Such shrines are at present very common in all parts of the world, in India, China, and America; and the supposition is, that they were survivals from pre-historic times, but originated in the rectangular house, which, because, it was a home became very sacred. In Mexico and Central America there were temples which were rectangular in shape, and were placed upon the summit of circular or oblong pyramids, and were reached by stair-ways placed upon the four sides of the pyramids, every part of them being symbolic of the nature powers, the sky, the four parts of the compass, and the earth. They were called caracols, and were very sacred. It is not known from what source they were derived, but a supposition is, that they were the survivals of the primitive hut. In favor of this, is the fact that the figure of a hut is often seen sculptured on the doorways of the palaces and temples, with the image of the divinity seated inside the door, and a manitou face above the door, conveying the idea that it represented the primitive

shrine, which was in itself the survival of the still earlier hut or house. Such circular structures are found at Mayapan, at Copan and at Chichen-Itza, and everywhere retaining the same shape. The caracol or round tower of Chichen-Itza has been described by Mr. W. H. Holmes. It is upon the summit of a pyramid and consists of two stories, one above the other, with a central column or core, seven feet in diameter, with annular galleries five feet wide, connected by winding stairs, also supporting buttresses in the walls, the whole finished with heavy cornices.

VI. This leads us to a view of the temple, as a shrine, and especially as a shrine situated on the summit of a pyramid. It will be understood that there were no such temples in Egypt, which was the land of the pyramid, for whatever shrines there were there, were situated either in caves hewn out of the rocks, or in the chambers in front of the mastabas or tombs, or in the interior of the columnar temples, and never upon the summit of pyramids.



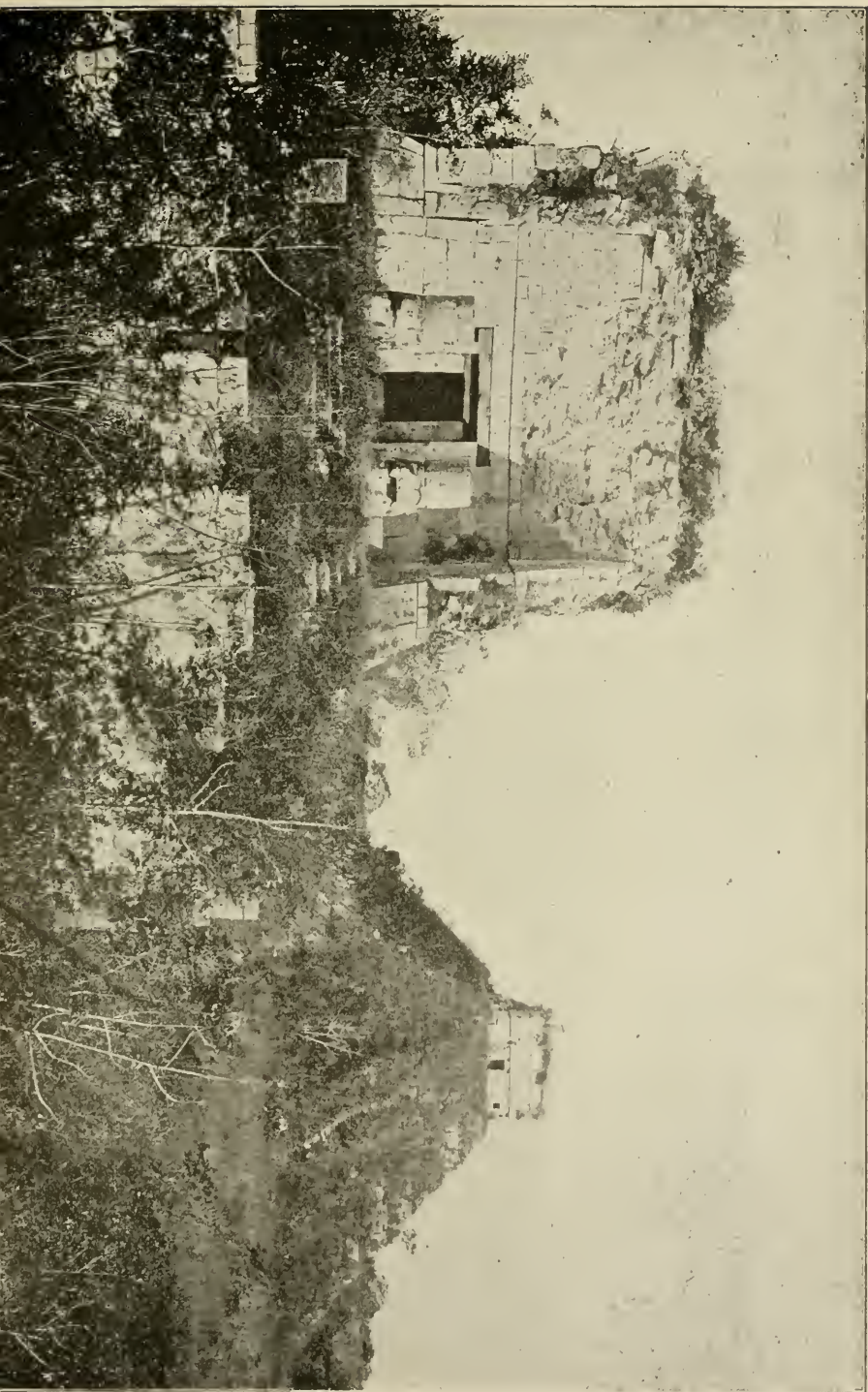
THE SHRINE AT PALENQUE.

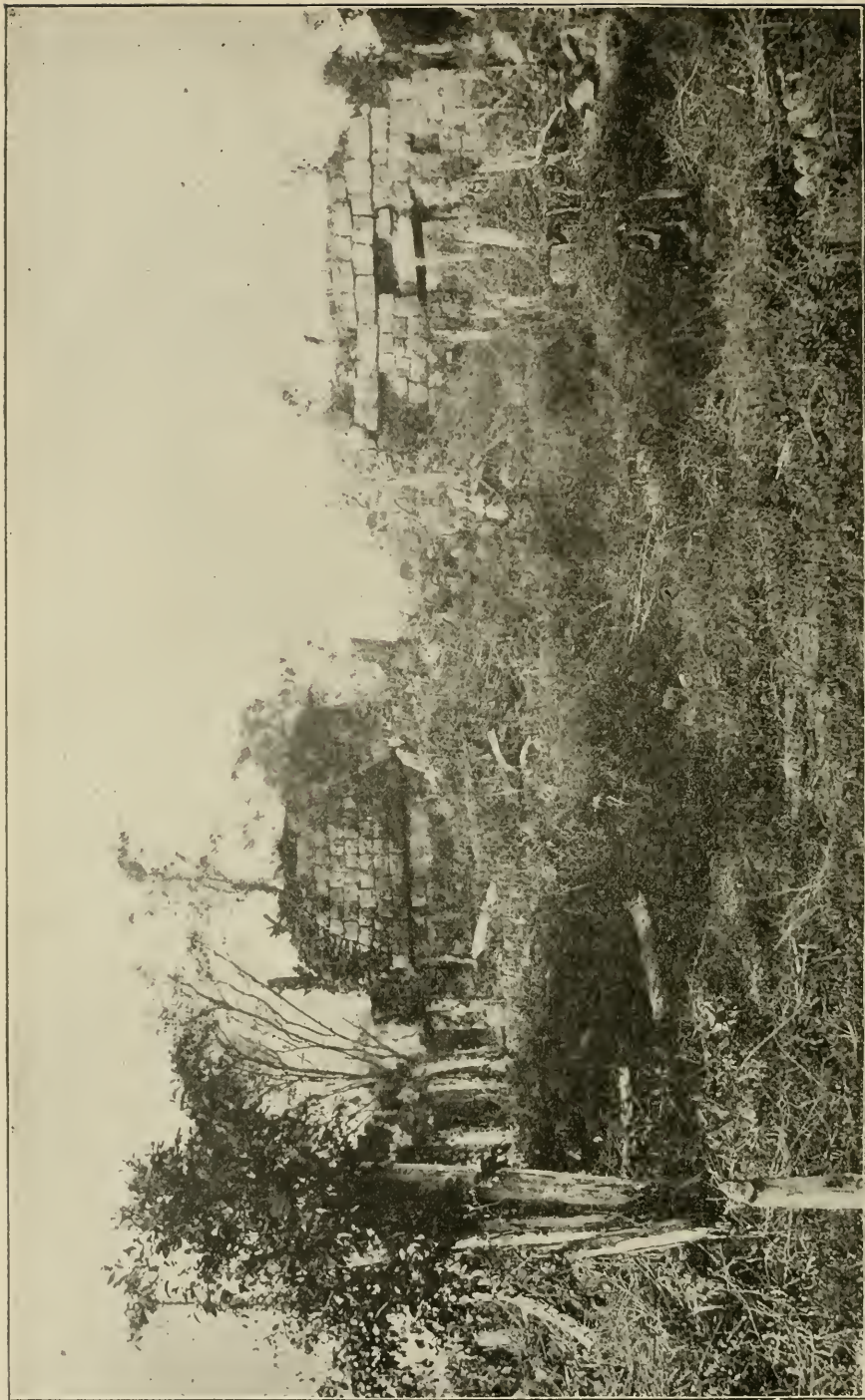
The rectangular shrine is the form of temple which was most common in Central America. This generally had a projecting cornice, a sloping roof resembling the modern mansard roof, but generally surmounted by a high roof-comb on which were sculptured various statues and symbolic figures. It had square piers in front on which mythological figures were sculptured.

The best preserved temples are those found at Xochicalco the hill of flowers. Here is a natural elevation of conical form, with an old base over two miles in circumference, rising from the plain to a height of nearly four hundred feet.

Five terraces, paved with stone and mortar, and supported by perpendicular walls of the same material, extend in oval form entirely round the whole circumference of the hill, one above the other. Neither the width of the paved platforms, nor the height of the supporting walls, have been given by any explorer, but each terrace, with the corresponding intermediate slope, constitutes something over seventy feet of the height.

Shrines upon the summit of pyramids are more numerous in America than any where else, and, for this reason, we will

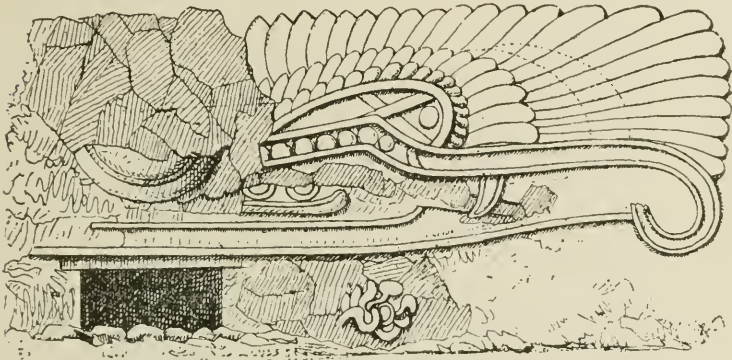




RUINED TEMPLES AT XKICHMOOK, YUCATAN.

confine our study of them to this continent. It may be said that there were formerly shrines in Mexico, and that here they were situated on the summit of pyramids, but very few specimens remain; one at Xochicalco, and one situated upon the summit of a mountain called La Casa del Tepozteco being the most notable. Altars were an essential part of the Teocallis and were used for human sacrifices. In Central America the temples were generally in the form of shrines and suggested a peaceable form of worship.

There is one peculiarity of the shrines of Central America which is especially worthy of notice. Instead of containing



WINGED CIRCLE IN YUCATAN.

an altar, as do many of the shrines and temples of Mexico, they contain sculptured tablets on which are portrayed the symbols of religion, the cross in one, the face of the sun in another, and the globe with a human figure seated upon it in a third. In one shrine, represented in the cut, there was a winged globe reminding us of the Egyptian symbol, on another were sculptured the figures of females, each bearing a child in her arms. In the rear of the shrine the tablets are so placed that the sun would shine through the doors and make them resplendent by its rays. The shrines were constructed with a double cornice and a sculptured facade, and were reached by wide stairways. The temple of the Beau Relief is however more interesting than this, for in this shrine was a finely sculptured figure seated gracefully upon a globe which was supported by an animal headed throne. There were other shrines in Central America, all of which suggest the worship of the sun and the heavenly bodies, but never suggest human sacrifices as does the Teocalli of Mexico.

The same kind of a construction appeared in all the cities of Mexico. Humboldt says among the tribes from the 7th to the 12th century, appeared in Mexico, five were enumerated as follows: Toltecs, Chicmeccs, Acolhuas, Tsaltecs, Aztecs, who spoke the same language, observed the same wor-

ship, constructed the same kind of pyramidal edifices, which they regarded as houses of their gods. These edifices, though of dimensions very different, had all the same form. They were pyramids of several stories, the sides of which were placed in exactly the direction of the meridian and parallel of the place. The teocallis arose from the middle of a vast enclosure surrounded by a wall. This enclosure, which one may compare to the temple of the Greeks, contained gardens, fountains, habitations for the priests, and, sometimes, even magazines for arms, for each house of the Mexican god. A great staircase led to the top of the truncated pyramid, on the summit of



COLUMNAR TEMPLE AT UXMAL.

which was a platform, on which were one or two chapels in the form of idols of the divinity to which the teocalli was dedicated. This part of the edifice ought to be regarded as the most sacred. It was there, the priest kept up the sacred fire. By the peculiar arrangement of the edifices, the sacrifices could be seen by a great mass of people at the same time, and from a distance. The procession as it ascended, or descended the staircase of the pyramid, made an imposing appearance. The interior of the edifice, served as a sepulchre for the king or priest.

Another temple has been discovered in the Usumasintla

Valley, at a place called Piedras Negras. There were here several temples hidden in the forests, and among them were several sacrificial stones; also a large number of Stelæ or carved tablets with human figures upon them. There was also an Acropolis between two of the temples with a stair-way leading to its summit. One of the most interesting temples in Mexico is one discovered and described by parties from the city of New York. This temple was upon a height that was almost inaccessible, and overlooked the vast plain in the centre of which was the beautiful lake.

It is a most picturesque spot, and, formerly supported a large population. On one of the most inaccessible peaks of the northern range of mountains, at a point which commands a view over the whole region was erected the old temple. Reaching the summit, we find, an irregular surface, divided into two parts, connected by a narrow neck; upon the western part is the temple; the eastern part contains vestiges of low walls, and terraces, occupying nearly the entire area. These may be the remains of the houses of the priests, the guardians of the sacred spot.

It is probable that a fire was lighted upon the altar which crowned the summit of this mountain and it could be seen at a great distance. If human victims were offered at this spot the sacrifice could be witnessed by the multitudes who were assembled in the plains below and the locality, with its surroundings, conspired with the ceremonies to make it a most ghastly scene, and such a sacrifice as would fill all spectators with awe and fear.

VII. We now pass to another and a very interesting class of temples, a class which was numerous in the historic lands of the East, but was also common in America during prehistoric times. The peculiarity of these temples was that they were built in the columnar style and were adorned with cornices and sculptured facades which gave them a very artistic appearance.

There were many columnar temples in America in prehistoric times. They however differed very much from those which have been known to history, as the most of them were placed upon the summit of a pyramid and were reached by a high flight of stairs, but were to a great extent inaccessible to the common people. In fact some of them were guarded against approach by objects which were calculated to inspire every superstitious person with awe and fear. The most notable of these temples were those situated at Palenque especially at Chichen Itza and Uxmal. In the former place there were two such temples, one of which is represented in the cut reproduced from Charnay's celebrated work entitled *The Ancient Cities of the New World*. The following is his description of the temple:

"The castillo, or rather temple, is reared on a pyramid facing north and south, is the most interesting at Chichen. The four sides of the pyramid are occupied by staircases facing the cardinal points. The base measures 175 ft. It consists of nine small esplanades or terraces, narrowing as they ascend, but supported by perpendicular walls. The upper platform is 68 feet above the level and is reached by a flight of ninety steps 38 feet wide, on each side of which is a balustrade formed by a gigantic plumed serpent, whose body ran down the balustrade and whose nose and tongue protruded 8 ft. beyond the foot of the stairway. On the summit is a structure 39 ft. on one side and 28 ft. high. The northern facade consists of a portico supported by two massive columns representing two serpents' heads, while the shafts were ornamented by feathers, showing that the temple was dedicated to Cu-

culcan, the god of rain. These two shafts are almost exact representations of a Toltec column unearthed at Tula, though the two columns were found three hundred leagues from each other and separated by an interval of several centuries.

Mr. W. H. Holmes has also described the same temple, but has shown that the capitals of these serpent columns were in reality gigantic serpent tails which projected beyond the cornice and supported the wooden lintels, though the serpent form has been impaired so as to be hardly perceptible.

It is to be noticed that some of the shrines or temples of Central America have winged circles surmounting the doorways which remind us of those which surmount the

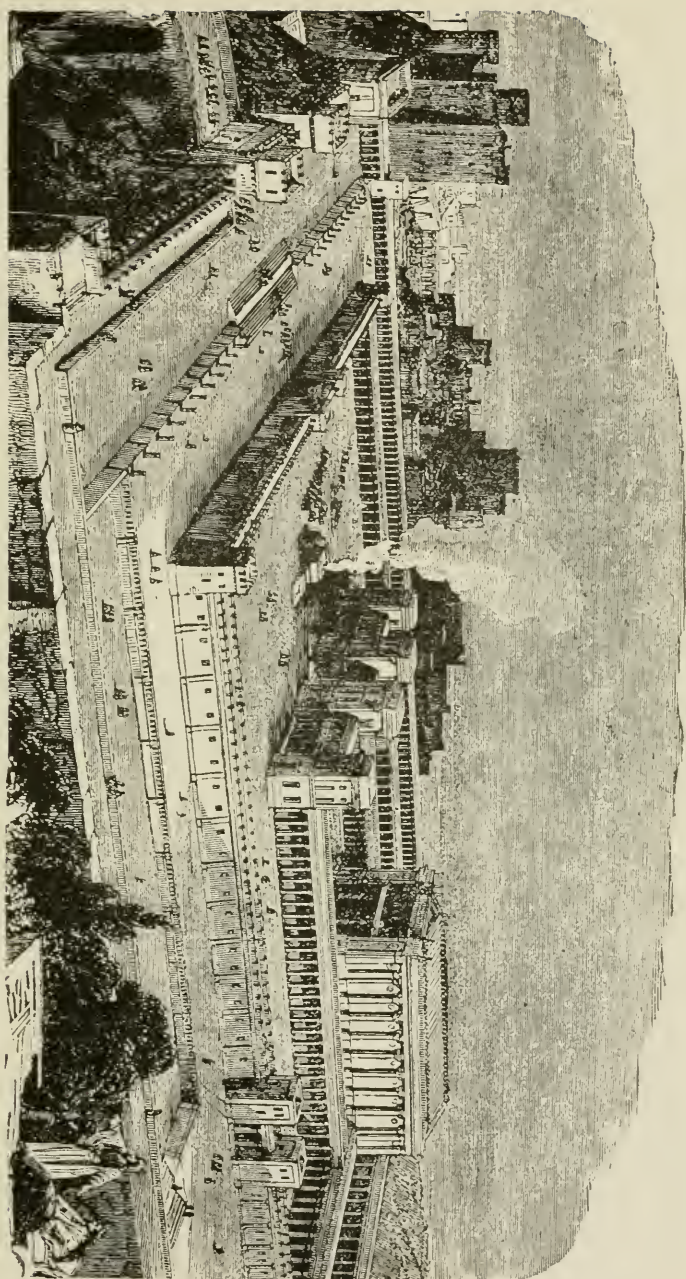
Egyptian temples, though the feathers of the wings are turned up instead of down and the ends rest upon an ornament which resembles a curved bow, one such temple being found at Ocaingo. There is also a temple on the Island of Cozumel which has columns in front of the shrine, one of which is carved into the shape of a human figure kneeling, but supporting on his shoulders the capital and the lintel.

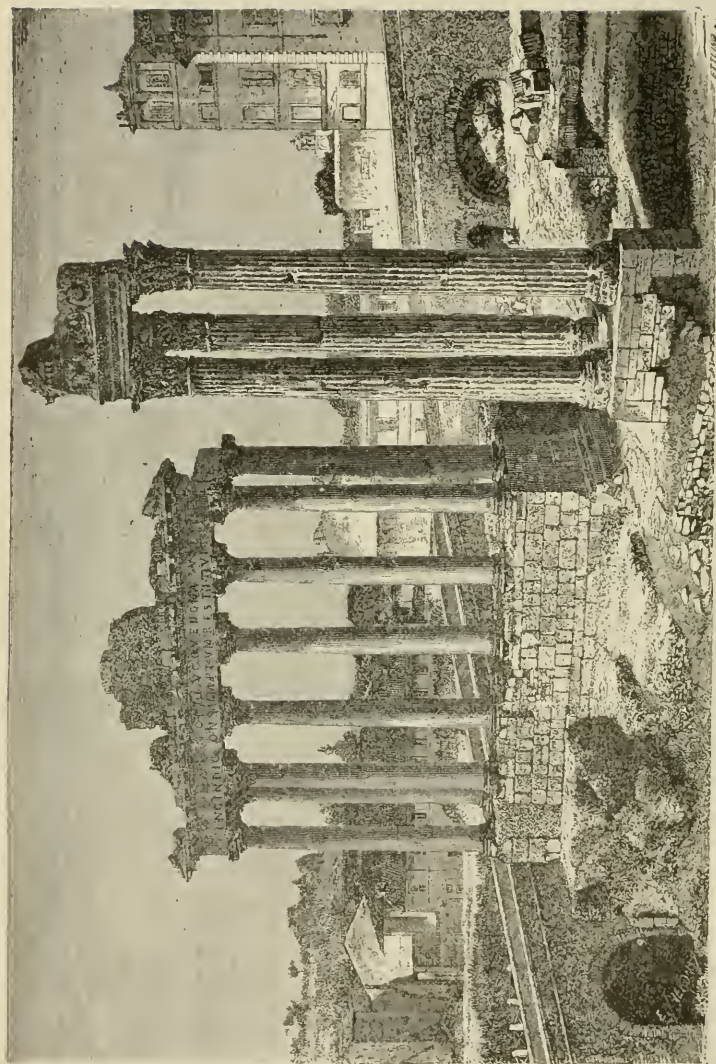
In Egypt, the tomb was in the shape of a house, and yet, it was a temple, for the friends of the deceased came and sat in the chamber which was a part of the tomb, and partook of their feasts. The spirit of the deceased was also sup-



OBELISKS AND COLUMN AT KARNAK.

SOLOMON'S TEMPLE AT JERUSALEM.





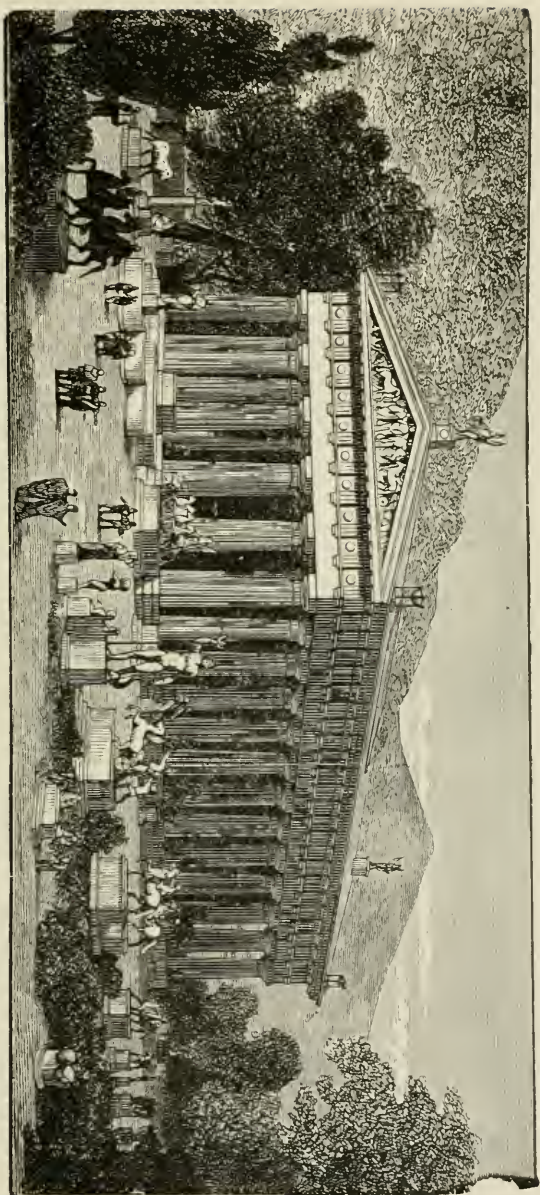
TEMPLES OF SATURN AND VESPASIAN AT ROME.

posed to be present, and to partake of the food which was represented by sculptured figures upon the wall.

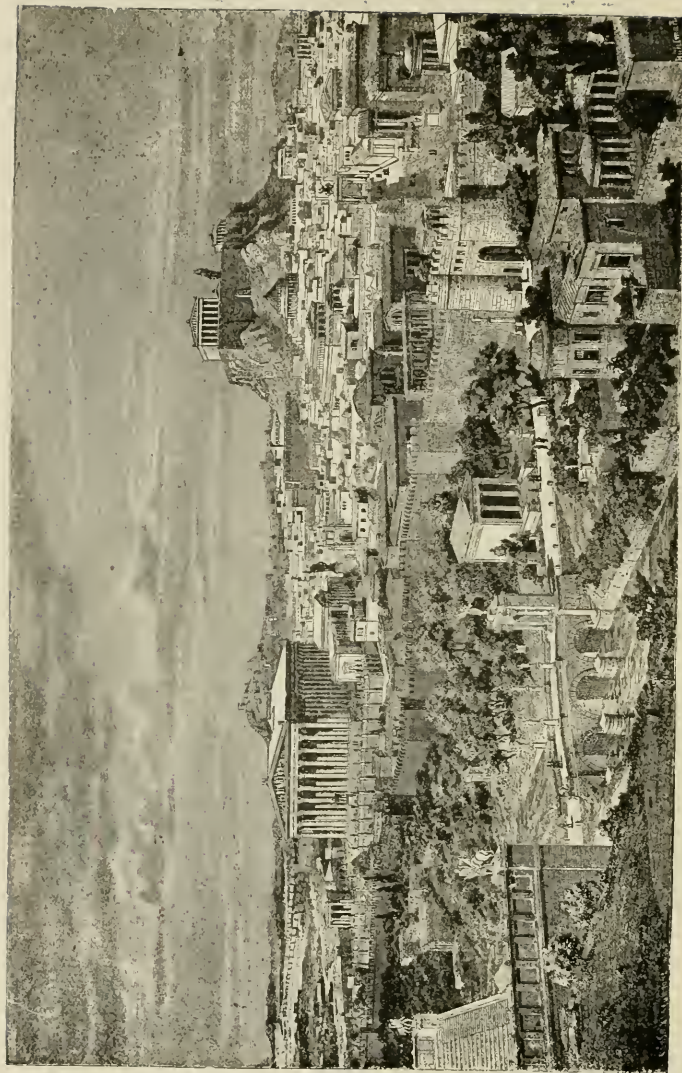
The temples of Egypt, became the most attractive structures in the world, but they owed their attractiveness to the fact that they were built in the shape of a palace rather than of a pyramid, and their interior was filled with all the decorations of art and architecture of which the genius of Egyptians was capable. The exterior of the Egyptian temple was somewhat exclusive, for it was surrounded on three sides by a dead wall, without any openings, and covered, only by the sculptured figures of kings and priests; on the fourth side, there was a lofty gateway, which hid the temple partly from view, but the interior was very imposing. In this, the temples of Egypt differed from the temples of Babylonia, for there the outside only, was attractive, the inside had no features worthy of notice. The Babylonian temple was generally a ziggurat or tower which arose in separate terraces to a great height, each terrace being ornamented in a different way and, having a different color. The shrine was upon the summit, but was inaccessible to the people. The Babylonian tower was imposing for its height, and, standing, as it did, near the palace, and overtopping the city, conveyed an impression similar to that of the pyramids, but the art of the Babylonians was expended upon the palace rather than the temple. The temple in both countries, was the place for religious processions, but in Babylonia, the processions were led around the tower, upon the outside very much as they were around the Teocalli or pyramid temple of Mexico; but the processions in Egypt were led into the temples through long avenues guarded by human headed statues or sphinxes until the lofty propyleum was reached; there the ceremony became more exclusive; the worshipers were led into the temple through the various courts, within which were lofty columns arranged in clusters, and finished in the highest style of art with their capitals, carved in the shape of the lotus, which was the sacred flower of the Egyptians, their sides covered with sculptured figures and painted with most beautiful colors. The great stone beams surmounting the columns and the imposing walls gave the impression of grandeur which was superior, if possible, to any thing which could be seen in the world.

The Greek temple was also in the form of a palace, but instead of having the pillars or columns upon the inside, and the dead walls upon the outside, it followed the opposite pattern for the Greek temple was always surrounded by columns, while the interior was occupied by the statue of the divinity, or was a mere shrine, where a few might assemble. Still the Greek temple never lost its resemblance to the house. The decorations of art were heaped upon the frieze and front, and the mythology of the ancients was embodied in the statuary that surrounded it.

The plates represent the different kinds of temples which prevailed at an early date throughout the world, and at the same time illustrates the progress of temple architecture through its different stages. It will be seen from them that while the temple was always the home of the Divinity, yet it was guarded from intrusion by various barriers, either by being placed upon the summit of a high pyramid, with balustrades in the form of huge serpents, or being built within a walled inclosure with high gateways in front of it, or as in the case of the temples of Greece, being built upon heights of ground, which were used as citadels, and so were safe from assault. The situation of the temples, however, depended upon the character of the country. Those of Egypt were built upon the plain, with walls of stone surrounding them, but with a single entrance through the lofty gateway, having columns extending through the interior until the shrine was reached; while those of Greece were perched upon rocky promontories, such as the Acropolis of Athens and Corinth, and stood unenclosed, with highly ornamented columns surrounding them on all sides. The temples themselves seldom arose to a great height, but were furnished with towers or lofty columns or obelisks, or were placed upon rocky heights, so that they became very imposing in their appearance, and yet never lost their original semblance. The chief charms of the temples of Greece and Rome were the graceful columns placed in single or double rows, surmounted by coping stones which formed a crown to the columns, above which arose a roof peak in whose gable ends was grouped the most elaborate sculpture. The Parthenon stood upon the Acropolis, the most perfect specimen of the Doric order. The temple of Theseus stood upon a gentle knoll, the complete embodiment of the Ionic order, while the temple of Jupiter, the embodiment of the Corinthian order, stood upon the level plain. In Egypt colors of various hues adorned the columns, but in Greece they were made of purest and whitest marble. The temple, however, was everywhere a most imposing structure, wherever it appeared, whether upon the heights of Zion, overlooking Jerusalem, or in the city of Thebes, not far away from the ancient pyramids, or in the stately city of Rome, where palaces abounded, or in the far off tropical forests of America.



TEMPLE AT OLYMPIA, GREECE



COLUMNAR TEMPLE AND ACROPOLIS AT ATHENS.

CHAPTER XVI.

SCENERY AND ARCHITECTURE IN MEXICO.

Much has been written about the Province of Mexico and its history. Descriptions have also been given of its antiquities and scenery by various authors, but very few engravings have been furnished which would illustrate this or give any idea of the topography. It is fortunate that the means for securing good pictures of natural features have been increased so much, and that the expense has been so much lessened, for the result is that many of the magazines are publishing these pictures and making the scenery of our sister republic familiar to the common people. It is a remarkable fact that the railroads have become educators; they not only carry tourists and intelligent travellers to the distant places, but they bring near to their own patrons and to all classes the scenes which are reproduced and published.

All the writers who have ever visited Mexico speak of the wonderful beauty and variety of the scenery, and describe the country as presenting "many charming views which unfold before the traveller's gaze; dazzling light and colors mingled with rich tints, and rich fertile valleys interwoven between high mountains." The country has been divided into three parts: first, the region near the coast, which is very low and hot and called "Terra Caliente"; it has a tropical climate and the vegetation is such as grows in the tropics. Malaria prevails and it is unhealthy for any, except the natives. Next to this is the region which is called the "Terra Templada," a temperate belt adjacent to the region before mentioned. Still further into the interior is the "Terra Fria," a cool tableland. This is best known in history and was at an early date the seat of a high grade of civilization. It is a plateau raised some 5,000 to 8,000 feet above the sea, and has several mountain peaks rising to a great height above it; the mountains being very conspicuous at great distances. Prominent among these mountains are Orizaba, "the star mountain"; Popocatepetl, "the mountain of smoke," and Izzacelhuatl, "the white woman."

For variety and striking contrasts the climate and scenery of Mexico are surpassed by no region of equal extent in the world. One rises as he passes from the sea to the interior from the hot borderland to a temperate belt, and then reaches the Terra Fria, or cool, elevated plateau, and may finally reach the region of perpetual snow. The plateau is variegated with many lakes. The soil, almost everywhere fertile, is over spread with a variety of nopal, maguey, and forests of evergreen, among which the graceful fir and umbrageous oak stand

conspicuous. Seasons come and go and leave no mark behind; or it may be said that spring, satisfied with its abode there, takes up its perpetual rest; the temperature is ever mellow, with resplendant sunshine by day, while at night the stars shine with a brilliancy nowhere excelled.

As to the native inhabitants, at the time of the conquest a large portion of this region, as well as a part of Central America, was occupied by those natives we call civilized, but even then there was a great difference between the people. The natives of the valley of Mexico are represented as tall, well-made, and robust. Throughout the tableland the men are muscular and well-proportioned. In Vera Cruz they are somewhat shorter—from four feet six inches to five feet in height—and clumsily made, having their knees farther apart than Europeans, and walk with their toes turned in; they are of a darker complexion than those on the tablelands.

The natives as a whole, have been classed by Humboldt "with the aborigines of Canada, Peru, Florida, and Brazil, having elongated eyes, prominent cheeks, large lips, and a sweet expression about the mouth, forming a strong contrast with their otherwise gloomy and severe aspect."

According to Prescott they bear a strong resemblance to the Egyptians, but Violet le Duc asserts that the Malay type predominates. Rossi says that their physiognomy resembles that of the Asiatics. The question of race and origin has not yet been decided. Dr. Brinton, who held to the unity of the American race, would, of course, class them with the tribes of the North. Prof. Mason claims that the linguistic families may be divided into Shoshone tongues for the United States, the Piman for the Sonoran area, and the Nahuan for the great southern groups. The Apaches, who belong to the Athapascan stock, are stragglers into northern Mexico. The Maya-Quiche stock were situated farther south in Mexico and Central America. Here, then, we have the race question simplified by names which are familiar and easily understood. The other tribes, such as the Miztecs, Otiemis, Seri, Yuman, Tlascala, and Totonaca, are smaller and scattered tribes, whose languages have not yet been traced to their origin.

There has been, according to Mr. Walter Hough, a mixture of Oriental influences since the time of the Spanish conquest, and the Philippines have contributed to the products and the plants of Mexico, as trade and commerce was carried on by the Spaniards, between Mexico and Manila, and between Manila and China. This commerce and contact beginning as early as 1545, in the reign of Philip II., naturally complicates the archæology of the region, for there naturally would be certain articles and relics mingled with the ancient in such a way as to be taken for prehistoric relics.

It is probable, also, that the architecture of Mexico was very much affected by this contact with the Spanish on the one side, and with the natives of the Philippines on the other,

for a great variety appeared at a very early date. Mr. Hough says that all the circular houses in Mexico are of African origin, the style having been introduced by negroes; the native houses having been originally rectangular. This may be so, though there are many circular huts with thatched roofs represented in the façades of the Maya palaces.

Charnay, to be sure, held that the Toltec house was a square building, and that the hieroglyph Calli became the type of a particular form of architecture, which everywhere prevails; the walls, cornice, and roof, always being constructed after the same pattern. He compares the temple at Palenque to the Japanese temple, giving two cuts to illustrate his point.*

Shall we say, then, that the Toltec type of architecture was introduced from Japan, and the ordinary style of huts in use were introduced from Africa? In that case we must give up the idea of a native growth, of both art and architecture, and make everything foreign, or extra limital in its origin.

The point which we make in this connection is, that in Mexico there is, even at the present time, a great variety of architecture; some of it having been introduced from Spain; some, perhaps, from Manila; some from the United States; some from the ancient Maya races of Yucatan; some styles surviving from the ancient Nahua civilization, and some introduced, as Mr. Hough says, from Africa by negroes who were imported.

The question is, what was the original type and by what tribe was the ancient style introduced. We must remember that there was a great difference between the wild tribes and the civilized in the days of the conquest, and that the cities were very different from the rural districts. Take, for illustration, the landing of Cortez and his troops and their march toward the City of Mexico. It will be remembered that he landed on the coast at Vera Cruz, but as he advanced toward the capital he found a tribe called the Tlascalans, who had for a long time contended with the Aztecs of Mexico. Surrounded as they were by natural barriers of mountains, with a mountain pass, where they had established a fort as a gate between them and their enemies, they were as isolated almost as if in another land. Here Cortez rallied this people to his banner, and with their help was able to overcome the city.

The following is Mr. Prescott's description of Cortez's march from the sea: "It was the 16th of August, 1519. During the first day their road lay through the Terra Caliente, the beautiful land where they had been so long lingering; the land of the vanilla, cochineal, cacao (not till later days of the orange and the sugar-cane); products, which indigenous to Mexico, have now become the luxuries of Europe; the land where the fruits and the flowers chase one another in an unbroken circle through the year; where the gales are loaded

* See "Ancient Cities of the New World," page 250.

with perfumes until the sense aches at their sweetnees, and the groves are filled with many colored birds, and insects whose enamelled wings glisten like diamonds in the bright sun of the tropics. Such are the splendors of this paradise of the senses.

"At the close of the second day they reached Xalapa, a place still retaining the same Aztec name. This town stands midway up the long ascent, at an elevation where the vapors from the ocean, touching in their westerly progress, maintain a rich verdure throughout the year. From this delicious spot, the Spaniards enjoyed one of the grandest prospects in nature. Before them was the steep ascent, much steeper after this point, which they were to climb. On the right rose the Sierra Madre, girt with its dark belt of pines, and its long lines of shadowy hills stretching away in the distance. To the south, in brilliant contrast, stood the mighty Orizaba, with its white robes of snow descending far down its sides; towering in solitary grandeur, the giant spectre of the Andes. Behind them, they beheld, unrolled at their feet, the magnificent terra caliente, with its gay confusion of meadows, streams, and flowering forests, sprinkled over with shining Indian villages; while a faint line of light on the edge of the horizon told them that there was the ocean, beyond which were the kindred and country—they were many of them never more to see. They had reached the level of more than 7,000 feet above the ocean, where the great sheet of tableland spreads out for hundreds of miles along the crests of the Cordilleras. The country showed signs of careful cultivation, but the products were for the most part not familiar to the eyes of the Spaniards. Fields and hedges of the various kinds of the cactus, the towering organum, and plantations of aloes with rich yellow clusters of flowers on their tall stems, affording drink and clothing to the Aztecs, were everywhere seen.

"Suddenly the troops came upon what seemed the environs of a populous city, which, as they entered it, appeared to surpass even that of Cempoalla in the size and solidity of its structures. They were of stone and lime, many of them spacious and tolerably high. There were Teocallis in the place, and in the suburbs they had seen a receptacle in which, according to Bernal Diaz, were stored 100,000 skulls of victims, all piled and ranged in order. The lord of the town ruled over 20,000 vassals. The Spanish commander remained in the city four or five days. Their route afterward opened on a broad and verdant valley watered by a noble stream. All along this river, on both sides of it, an unbroken line of Indian dwellings, so near as almost to touch one another, extended for three or four leagues; arguing a population much denser than at present. On a rough and rising ground stood a town, that might contain five or six thousand inhabitants, commanded by a fortress, which with its walls and trenches seemed to the Spaniards quite on a level with similar works in Europe. As they advanced into a country of rougher and bolder features, their progress was sud-

denly arrested by a remarkable fortification. It was a stone wall, nine feet in height and twenty in thickness, with a parapet, a foot and a half broad, raised on the summit for the protection of those who defended it. It had only one opening in the centre, made by two semicircular lines of wall overlapping each other for the space of forty paces, and affording a passage-way between the parts, so contrived, therefore, as to be perfectly commanded by the inner wall. This fortification, which extended more than two leagues, rested at either end on the bold, natural buttresses formed by the Sierra Madre. The work was built of immense blocks of stone, nicely laid together without cement; and the remains still existing, among which are rocks of the whole breadth of the rampart, fully attest its solidity and size. This singular structure marked the limits of Tlascal, and was intended, as the natives told the Spaniards, as a barrier against the Mexican invasions. The army paused, filled with amazement at the contemplation of this cyclopean monument, which naturally suggested reflections on the strength and resources of the people who had raised it.

"The fruitfulness of the soil was indicated by the name of the country—Tlascal, signifying the land of bread. The mountain barriers by which Tlascal is encompassed, afforded many strong natural positions of defence.*"

The march of the army afterward brought the Spaniards to a point where they could get a view of the whole region, with its lofty mountain peaks, which lifted their snow-covered heads toward the sky; also the great plateau stretched out toward the sea. To the west of them stood the mysterious pair of volcanoes, like sentinels watching over the scene. Below was the rich valley of Mexico, with its beautiful lakes and many cities.

Prescott says: "The sides of the sierra were clothed with dark forests of pine, cypress, and cedar, through which glimpses now and then opened into fathomless dells and valleys, whose depths, far down in the sultry climate of the tropics, were lost in a glowing wilderness of vegetation. From the crest of the mountain range the eye travelled over the broad expanse of country which they had lately crossed, far away to the green plains of Cholula. Towards the west they looked down on the Mexican valley, from a point of view wholly different from that which they had before occupied, but still offering the same beautiful spectacle, with its lakes trembling in the light; its gay cities and villas floating on their bosom; its teocallis touched with fire; its cultivated slopes and dark hills of porphyry stretching away in dim perspective to the verge of the horizon. At their feet lay the city of Tezcuco, which, modestly retiring behind her deep groves of cypress, formed a contrast to her more ambitious rival on the other side of the lake, who seemed to glory in the unveiled splendors of her charms as Mistress of the Valley."†

* See Prescott's "Conquest of Mexico," Vol. I., page 278.

† See Prescott's "Conquest of Mexico," Vol. II., pages 35-36.

Now, this picture, which our much admired and learned historian has drawn, is very suggestive, for it convinces us that the very scenery and topography which so impressed the Spaniards on their arrival, had also affected that remarkable people which had grown up in the midst of these environments and had developed so strange a civilization in these different regions. It was undoubtedly owing to the fertility of the soil and the resources of the country that the Aztec tribe, who had settled beside the beautiful lake, had grown into a powerful people, and were able to usurp power over all other tribes. This situation had already developed in them an aggressive spirit, so that the native chiefs were in a fair way to become, like the Incas of Peru, the despots who held all the region under their control.

As to the architecture which existed in this region at the time of the conquest, we cannot say that this originated with the Aztecs or Miztecs, or any of the known tribes of the Nahuas, or that they were at all influenced by the scenery or the surroundings, for according to all accounts they were inherited by that mysterious people called the Toltecs, who in turn had received them from the people of the Maya stock, their beginning dating as far back as the Christian era.

It appears that architecture in Mexico reached during the prehistoric age, a stage of advancement quite equal to that which prevailed in other parts of the world during the early days of history, and yet it was an architecture which arose during the Stone Age—the structures which were erected, having been brought into their shape by the aid of stone tools alone, and without any of the appliances which other nations seem to have adopted, though a few copper implements, perhaps, were used for the more delicate touchings of prehistoric sculpture.

It may be that the architecture and the art should be assigned to what is coming to be called, "the Copper Age," rather than the Stone Age; yet even with this distinction,—it is a matter of wonder that a rude uncivilized people could have accomplished so much in this direction. Some maintain that there was a period in Greece and Asia Minor when art and architecture reached a very high stage, and that there was afterwards a decline; the age immediately preceding the opening of history being in reality in advance of that which followed; but here—in Mexico—there was no decline until the advent of the Spaniards, and the subjugation of the people to their oppressive dominion. It is not strange that the barbaric magnificence of the so-called cities of Mexico surprised the conquerors, and that they compared the palaces and temples which they saw, to the Alhambra and other wonders of architecture in Europe. Nor is it surprising that their descriptions of what they saw should seem like exaggerations, for they were undoubtedly colored and made vivid by an imagination which had been excited by this strange scene into which they had

entered. It is not easy, even at the present day, to look through the mountain scenery upon the modern cities, without being deeply impressed. But to the discoverers, as they looked down upon those marvelous ancient cities which were scattered through the beautiful valleys and spread along the shores of the silvery lakes, they seemed like the visions of another world. Those cities were laid in ruins, and nearly everything that had been erected by the native races has vanished from the sight. All is modern and new, yet every traveler who visits Mexico, and who examines the remains of the glory which has departed, is impressed with the superiority of the architecture of the prehistoric races.

It will be, then, instructive to take the testimony of a few of those travelers, who have visited Mexico, and give a picture of the scenery and the architecture as they described it. The archæologists may be divided into two classes: the one class is disposed to magnify the excellence of the art and architecture of Mexico and Central America, and to make the civilization of a superior character. Such take the descriptions of the early historians and writers as literally true, and do not discriminate between that which was imaginative and that which was real. The other class take a theory for their guidance, and enter these provinces with the purpose to prick the bubble of exaggeration, and bring everything to familiar standards, and are inclined to reduce everything down to the level of a rude aboriginal culture, which had not reached even the level of the barbaric races in other countries. Among the first class we will place M. D. Charnay, the famous archæologist, and Mr. H. H. Bancroft, the historian. In the other class, Mr. L. H. Morgan, the famous ethnologist, and Mr. Ad. F. Bandelier. Between the two we may strike a medium, which shall be near the truth, and may be taken as correct.

We begin with Mr. Charnay's description of the ancient ruins which he saw and the summary which he has drawn. He says: "We are filled with admiration for the marvelous building capacity of the people; for unlike most nations, they used every material at once; they coated their inner walls with mud and mortar, faced their outer walls with brick and stone, built wooden roofs, and brick and stone stair-cases. They were acquainted with pilasters, with caryatides, with square and round columns. Indeed, they seem to have been familiar with every architectural device. That they were painters and decorators we have ample indications in the houses of Tula, where the walls are decorated with rosettes, palms, and red and white and grey geometrical figures on a black background.

It is difficult to explain how, with the tools they had, they could cut, not only the hardest substances, but also, build the numerous structures which are still seen in Mexico and Central America, together with the sculptures, bas relieves, statues, and inscriptions, like those which have been discovered.

Clavigero says that stone was worked with tools of hard

stone; that copper hatchets were used by carpenters, also to cultivate the soil and to fell trees.

Mendieta writes that both carpenters and joiners used copper tools, but their work was not so beautiful as that of the sculptors, who had silex implements.

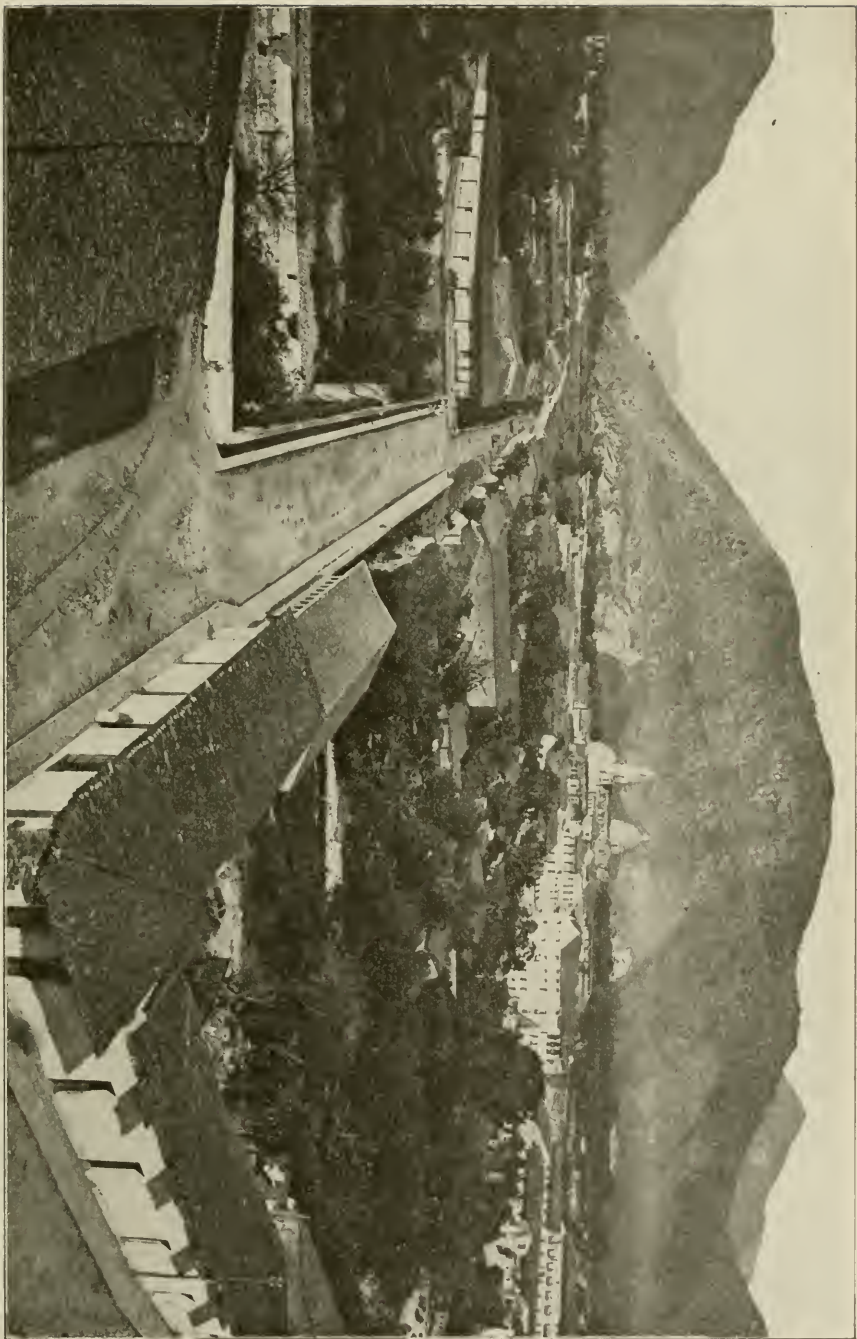
Charnay further says: "It is known that there are copper mines in Mexico, and discoveries have been made which show that these mines were worked in prehistoric times. In one old mine there was found amid the rubbish, 142 stones of different dimensions, shaped like hammers and wedges, the edges of which were blunt or broken. Copper has been found in Chili, Colombia, Chihuahua, and in New Mexico. Before the conquest, the Indians procured lead and tin from the mines, but copper was the metal used in mechanical arts."

Bernal Diaz says: "In my second expedition the inhabitants brought upwards of 600 copper hatchets, having wooden handles, exquisitely painted, and so polished that at first we thought they were gold. Copper tablets, varying in thickness and shaped like the Egyptian tau or crescent shaped, were used as currency in various regions. The American tribes had reached the transition point between the polished stone and the bronze period, which was marked by considerable progress in architecture and some branches of science. With them this period lasted longer than in the Old World, owing to their never having come in contact with nations of higher civilization, or with those who possessed better tools."

Now, it is to the development of art and architecture in Mexico, during the Stone and Copper Ages, that we would call attention. We have already intimated that this process began far back in the prehistoric period, and in the region far south of Anahuac, among the famous Maya stock, but was transmitted by the Toltecs. As to their origin and early history, we are not at all certain, for there are many things which show that they like the Incas of Peru, had brought in with them a civilization which had been derived, or at least affected by that which prevailed thousands of years before on the Asiatic continent.

The Toltecs were well instructed in agriculture and many of the most useful mechanical arts; were nice workers of metals. They invented the complex arrangements adopted by the Aztecs. They established their capital at Tula, north of the Mexican valley, and the remains of extensive buildings have been discovered by Charnay and others. The noble ruins of religious and other edifices still to be seen, are referred to the people whose name, Toltec, has passed into a synonym for architect. They entered the territory of Anahuac, about 600 A.D.; 400 years later they disappeared as silently and mysteriously as they had entered it. After the lapse of another hundred years, a rude tribe, called the Chichimecs, came down from the northwest. Still later, the Aztecs and Tezcucans entered the land from the north as wild tribes, but rapidly grew into a civilized people.

VIEW OF ORIZABA, MEXICO.





SCENERY IN MEXICO.

There was a remarkable correlation between the topography of Mexico and the character of the cities located there; for some of them were located upon the great plateau, surrounded by natural defenses; others in the valley, surrounded by rich agricultural fields, and others near the summit of the mountains, where they were very conspicuous; the most interesting of all being situated near the centre of the lake itself.

Several questions arise in connection with the ancient cities of Mexico, which need to be answered before we can proceed with the description of them. They are: First, were they worthy of the name *cities*? second, are the descriptions which were given by the Spanish historians correct, or must we rely upon the evidence of the archaeologists for our knowledge of their real character? third, what is the testimony of history concerning these cities and their early growth and progress? fourth, in regard to the architecture which embodied itself in these ancient cities: can we distinguish it from that which preceded it, and so decide what cities belonged to the Aztec, and what to the Toltec period.

I. In reference to the first question, we may say that certain modern writers have been disposed to reject the term *city* altogether from their vocabulary, when speaking of ancient places in America, whether found in Mexico, Central America, or Peru; and in its place use the term *pueblo*, conveying the idea that they were nothing more nor less than large Indian villages, similar to those which are still occupied in New Mexico, and that the people who built them were no more civilized than the Indian tribes of the North. We maintain, however, that there was a great difference between the Indian villages and the so-called cities, and that this difference was an index of the stage of culture which had been reached.

To illustrate: we find, even at the present time, Eskimo villages which are mere collections of huts constructed of ice and snow, or of bone and bark, and approached by long passageways. We find that the tribes in the eastern portion of the continent dwelt in stockade villages, or in inclosures surrounded by earthworks; their houses being constructed mainly of wood. There are villages on the Northwest coast, which belong to the fishermen and hunters, the most of which are constructed of wood, and are arranged in a line along the water front, and are marked by an immense array of totem-poles, which seem at a distance like masts of vessels, but are indicative of the history and ancestry of the people.

In the more central districts, especially on the plateau, the villages are contained in great communistic houses, many of which are placed upon the summits of the mesas, and are built of adobe or of stone.

In Peru the villages were generally the capitals, and were connected with roadways which passed over the mountain; they were under the control of the Incas, the capital being the centre, where were the finest specimens of architecture.

In Mexico and Central America people seem to have been gathered into large places, which were laid out after a fixed order and were under a central government, and abounded with temples, palaces, canals, bridges, fountains, and gardens, and contained many elaborate specimens of architecture.

These several types of native architecture represented the various grades of civilization, each one of which was confined to a separate geographical district and is suggestive of a distinct form of aboriginal culture.

It should be remembered that these Aztec cities had a very different origin from the ordinary Indian villages of the North, and were built on a very different plan. They may have grown up out of rude villages, and the people may have come up from the clan life into a later social organization; yet so much of their art and architecture was borrowed from the civilization which had previously existed among the Toltecs, that the signs of their own native growth were lost in that which had been added to it. Every people owes its architecture and its art to the different elements which have prevailed in the region, and we can no more confound the Mexican city with the pueblo of New Mexico, than we can the modern city with the little hamlet of log houses, or the houses of the white man with the hut of the ordinary Indian. The growth of society was greatly modified by the surroundings, and the city which grew up in the midst of the beautiful lake and was connected with the banks by long artificial dykes must have had a very different history from that of villages which had been erected on the summits of the lofty mesas and which owed their defense to the walls by which they were surrounded, and their conveniences to the terraces with which they were provided.

There were, to be sure, other cities built upon the summits of mountains of Mexico, as Messrs. Holmes and Charnay have shown; but these mountain cities, which stretch out at great length and cover the entire summits, are very different from the compact pueblos which were compressed into one great house, and resembled great bee-hives with their cells occupied by human beings. The government of a monarch, who ruled over a large district and who subordinated all adjoining tribes to his own power, was very different from that of a village *cacique*, who ruled over a single village and had a few officers subject to his command, but who knew all of his people by name, as a father does his children.

The Spanish historians did not stop to ask the history of the people before they gave the name "city" to the various places which they entered. They knew that they were governed by religious despots, and that in the midst of each, there were temples, where bloody sacrifices had been offered, and it was very natural that they should call the places cities, and their rulers kings or monarchs, and their religious men priests, and that they should apply the very terms which were in common

use among them, in speaking of the objects which they saw. They were accustomed to the architecture which had grown up in Europe during the middle ages, and their minds would naturally revert to feudal despots, who dwelt in their castles and who ruled over their retainers, who lived in the surrounding forests.

It was not to be expected of the Spaniards at this time that they would draw the distinction between the ancient cities of Mexico and the ordinary Indian villages, and certainly not to show the difference between the ancient cities and the pueblos of New Mexico, for they knew nothing of the latter.

The names* which the Spanish historians used would of themselves show very clearly that there was a very different condition of things among the ancient Mexicans from that which prevailed among the northern tribes. Consequently the term *pueblo* should not be applied to the cities, nor *medicine lodge* to the temple, nor *council houses* to the palaces, nor *medicine men* to the priests, nor *tribal chiefs* to the kings. Tribal society may have continued on a basis of kinship, but self-defense brought about the confederacy of the tribes of Mexico, and this confederacy resulted in establishing cities which were in reality capitals.

The City of Mexico was divided into four principal quarters, with twenty war-chiefs, one chief representing the element of worship, all under one head, the "chief of men," or king, who seems to have been like the monarchs of the East, clothed with power of priest and king.

II. In reference to the descriptions by the historians, it should be said that there were many things to account for them. While they have been pronounced by various critics as extravagant exaggerations, yet the latest researches are proving that they were in the main quite correct. There were certain influences which would lead them to give a rose-colored view, and yet this was better than a tame and spiritless account. The reports of the discovery so recently made by Columbus and his company had aroused great expectations, and there would naturally be a desire in the minds of the writers who were de-

* We take at random from Bandelier's report the following: "The residence of the CHIEF OF MEN was called TECPAN, THE HOUSE OF THE COMMUNITY; for the official family had to wait upon the officers and chiefs who transacted business at the TECPAN. The officer called KING of Mexico, or EMPEROR of Anahuac, was Tlacateuchtl; while the MAJOR DOMO, or keeper of the tribute, was called Cihuacohuatl, HEAD-CHIEF. The lands of the official house were called TECPANTALLI, and constituted tribal stores. The council was called TILACOPAN, and was composed of chiefs or speakers and supreme judges, and sat in two different halls in the TECPAN or palace; one of which was called the court of nobles. The twenty independent social units composing the Mexican tribe were called CALPULLI, and were bound to avenge any wrong. The holding of a particular territory, a common dialect, a common tribal worship, characterized each one of these CALPULLI; but the 'city' seems to have been the centre of the government, so that there was a change going on from the tribal stage to that of land tenure. Each CALPULLI had its particular god, which was worshipped as a tutelary deity within the territory, consequently each kin had its particular temple, and had a right to separate worship. Sahagun says that they offered many things in the houses which they called CALPULLI, which were like churches of different quarters, where those of the same kin gathered to sacrifice, as for other ceremonies.

"The great temple of the Mexican tribe was called CALMECAC, interpreted the 'Dark House.' This was the abode of such men as underwent severe trials preliminary to their investiture with the rank of chief. Each calpulli had a 'House of Youth' joined to the temple. There were houses of education. Besides these, there was a special place for the education of the children of noblemen. Those who were trained for the priesthood dwelt in the house called CALMECAC."

scribing the new scenes into which they were entering to meet these expectations, and this possibly led them to exaggerate their reports. It was, however, perfectly natural that they should draw a comparison between that which they saw in the New World and that which was so familiar to them in the Old, for their minds would inevitably revert to their native country, and there was no better way of expressing themselves.

It should not be considered as owing altogether to a purpose to deceive, that the wonderful scenes which came before their eyes were vividly described, for the Spaniards were a very impressible people and lived in a romantic age, and were accustomed to speak and write in figurative language.

There is no doubt that the explorers were greatly surprised by the scenes which came to their vision as they landed upon the coast and passed into the interior, especially when they reached the borders of the Plateau and were able to get a glimpse of the beautiful valley which was encompassed by the mountain ridges, and in the midst of which shone the silvery waters of the lake, which was to become the scene of their most daring exploits. The lofty snow-covered peaks of the great mountains, which stood like sentinels to guard the eastern entrance to the valley, also impressed them with a sense of the sublime, for they are still counted among the highest and grandest of the mountains of the world. The fact that in the midst of this beautiful valley there were so many so-called cities which were filled with a teeming population, and that so many of the appliances and conveniences of a native civilization were apparent was matter of surprise.

This civilization has been compared to that of Europe during the middle ages. It might better be compared to that of Egypt during the time of the first four dynasties, when the Pyramids were erected; or to that of Babylonia, before the time of its conquest by the Assyrians, when the great walled cities covered the valley of the Tigris and the terraced pyramids and palaces began to be built; or, still better, to the civilization of India and China, when their history first began to be written. The Spanish historians were disposed to draw a parallel between this civilization and that of the feudal times, when there were so many lords and barons dwelling in castles, who held the land in their possession and ruled the masses by their power, making them their vassals and retainers. There were no knights errant and no tournaments, no pilgrimages or distant journeys, no such conquests as made the names of certain kings of England famous.

The magnificence of the Moorish architecture never appeared in Mexico. The vision of the Alhambra had never dawned upon this rude people, there was no such mingling of turrets and towers with the vast expanse of the houses of great cities as met the eyes of Marco Polo in his journey to the East. The marvels of Cathay were not discovered by the Spaniards, though they were perhaps in hourly expectation of

finding them. There is no doubt that their minds were tintured with the stories which had been told of the cities of the East, and the conviction that America was a portion of the Asiatic continent had not lost its force. It was a day of romance and chivalry, and the kings of Europe were satisfied with nothing short of romance. It cannot be laid altogether to a love of exaggeration, that such writers as Sahagun, Bernal Diaz, Torquemada,* Veytia, Ixtlilxochitl and Clavigero gave such rose-colored views.

The accuracy of science was nowhere exercised, and literal exactness could not have been expected from them. It was, however, fortunate that there were those who could recognize the beauty of the scene, and could appreciate the inventions and improvements which had been wrought out by this strange people, who lived beyond the seas, and that they could adequately describe the style of the art and architecture which was prevalent.

The cities have passed away, and the scene which so wonderfully impressed the Spaniards at their advent has entirely changed. There are, to be sure, many modern cities which have grown up on the very sites where were these aboriginal towns, and some are disposed to draw the contrast between the ancient and the modern; but it is better to take the picture which was drawn by the historians as correct, and from this learn what were the peculiarities of the aboriginal life, though it may be necessary first, to consider the history of the people who dwelt there, and especially the architecture which prevailed.

III. Let us now turn to the third question and inquire into the history of the Aztecs, and see how rapidly they grew into a semi-civilized condition, and then ask about the influences which had conspired to produce this change. We hold that the Aztecs borrowed nearly all of their civilization from the Toltecs, that they adopted their style of architecture and their art, and yet there were certain peculiarities which distinguished the cities of the Aztecs from those of the Toltecs.

The Aztecs, who built the beautiful cities and temples which so charmed the eyes of the Spanish conquerors, as they came to the summit of the great mountain ridge, which surrounded the Valley of Mexico, were a rude tribe, who had entered the valley from the north about the year 1300. They wandered for a time, seeking for a suitable place in which they might make their home, and were at last influenced, as tradition goes, by a sight which they regarded as a sign from heaven. A bunch of cactus was growing upon a rock and upon the cactus an eagle

*Torquemada, a provincial of the Franciscan Order, came to the New World about the middle of the sixteenth century. As the generation of the Conquerors had not then passed away, he had ample opportunities for gathering the particulars of their enterprise from their own lips. Fifty years, during which he continued in the country, put him in possession of the traditions and usages of the natives, and enabled him to collect his history from the earliest missionaries, as well as from such monuments as the fanaticism of his own countrymen had not destroyed.

was perched, and in the eagle's claw was a serpent, which was always an expressive sign to the natives. This sight led them to settle upon the shores of the lake, which was then a small inland sea, its salt waters having been the result of the geological formation. The following description of the lake and the valley which contains it, will be interesting in this connection:

The Valley of Mexico is an immense basin of an approximately circular shape, sixty miles in diameter, completely bounded by high mountains and having only two or three passes out of it. No water drains out of the basin. The surface of the valley has a mean altitude above the sea of 7,413 feet, and an area of about 2,270 square miles. Mountain ranges arise on every side, making a great coral of rock, containing many villages and hamlets with the ancient capital as the centre. The valley, thus hemmed in with solid walls of rock, had been an inland sea for many cycles, and during the early existence of man the salt water spread over a large portion of the valley. The waters were gradually lessened by seepage and evaporation, and the Aztec immigrants, coming from the North in the fourteenth century, having received a sign that they were to build their city here, settled on its shores and began building dykes and combating the over-flow of the waters. Nearly fifty years before the discovery of America Nezahualcoyotl saw the necessity for a drainage canal, and commenced the work in 1450; he constructed an immense dyke to divide the fresh water which came down from the mountains from the salt water of the lakes. The City of Mexico was at this time but a rambling Indian village built upon floating rafts on the water and numerous islets on the borders of the lakes, but so arranged that in the event of the water rising, the whole city would float.

When Cortez arrived in Mexico in 1519, he found, to his great surprise, the defense of the city admirably arranged, and a most enchanting view of flowering islets formed the floating capital. Little towns and villages, half concealed by the foliage, looked, from a distance, like companies of wild swans riding quietly on the waves. A scene so new and wonderful filled the heart of the Spaniard with amazement. So astonished was he at extent of the water of Lake Tezcuco, that he describes it as a "sea that embraces the whole valley.*

The history of Mexico began with the invasion of the Toltecs from an unknown region during the fifth century, or about the time of the Roman occupation of Great Britain, and actually kept pace with the progress of Europe during the centuries that followed. It reminds us forcibly of the history of the British Islands during the middle ages; or, as Prescott says, during the time of Alfred the Great. There were, to be sure, no signs of the presence of the art and architecture of the civilized world, and no such contact with Rome or with the historic nations of the East; but the evidence is furnished us from the monuments and ruins which have been discovered, that the Toltec civilization did not fall short of that which prevailed in the south of Europe at this time. This Toltec civilization continued until the end of the twelfth century, when it was in turn forced to give way to that of the Aztec tribe, who swept down from the coast of California, Oregon, and other northern regions. It is generally agreed that the Aztecs formerly lived far to the north, and gradually worked their way southward until they reached the flowering Anahuac, but it is not

* See Romero's *Geography of Mexico*.

known what their condition was when they arrived at their final destination, though the general opinion is that they were like other wandering and migrating tribes, and were little above the condition of savages. Still, the fact that they so soon conformed to the civilization of the Toltecs who preceded them, and adopted their arts and architecture, renders it probable that their apparent savagery was only the result of their wandering life, and that they had the elements of growth within themselves.

IV. As to the architecture and its marvelous development, it will be remembered that the Aztecs were nomads differing very little from other wandering tribes; and yet in the course of three centuries they came up to a state of civilization which seemed to the Spaniards absolutely marvelous; showing that there was as rapid advancement among some of the prehistoric races as among the historic. Mr. Matthews says:

The general characteristics of the architecture are those which their predecessors, the Toltecs, possessed, and the supposition is that their rapid progress was owing to the fact, that they borrowed the civilization of their predecessors. Their temples were built after the pattern of the Toltecs, and so were the survivals of the native art. Their palaces, so called, were low, one story buildings, without windows; but rested upon terraces, which raised them above the surface. Each was composed of a stone basement and surrounded by a species of façade, carved in imitation of reeds and decorated in high relief with scrolls, monsters, and masks, such as are used at present on prows of battleships among the Polynesian Islanders. The roofs, as near as can be ascertained, were flat and the rooms were lighted from the doorways, which were, in some instances, widened by means of columns, which were ornaments as well as defences. The temples play a more important part than any other building. Forty thousand *Teocallis*, or "Houses of God," graced the ancient cities of Mexico, and many, though ruined, are still extant. Like the Chaldean temples they consisted, when whole, of huge platforms, piled one above another, which drew in as they ascended, and were crested with a shrine containing altars and images of gilded stone.

Two remarkable specimens still stand at Teotihuacan, near the City of Mexico; they were called anciently the "Houses of the Sun and Moon." Though much ruined and over-grown with vegetation, sufficient yet remains for intelligent restoration, and the fact that these temples are believed to belong to the Toltec civilization lends them an additional interest. The "Temple of the Sun" rose originally to a height of 171 feet, having a base of 615 square feet. That of the Moon was of smaller proportion, both had their faces turned toward the four cardinal points of the compass, which argues a knowledge of astronomy among the builders, and both were furnished with walled approaches placed at right angles to their four sides; which, while dedicated to the stars, still served the useful purpose of tombs for the chiefs of the nation.

Better known than these is the Teocalli of Cholula, the most marvelous of Mexican monuments, as regards size, and dedicated to Quetzalcoatl; rising only a few feet higher than the House of the Sun, yet it covers an area of twice the size of the pyramid of Cheops; according to some about twenty-six acres; according to others, sixty acres. Though so extensive in size, it cannot be compared architecturally with the great feat of masonry on the Nile, since even in its palmy days it could never have been much more than a huge mound of clay, and sun-dried brick, pierced with subterranean passages, and surmounted by a rude sanctuary without even the grace of good proportions.*

* See "The Story of Architecture" by C. T. Matthews, page 180.

We may say that there were many other cities in Mexico, which are now in ruins, some upon the mountains, others in the valleys; but the majority of them have been ascribed to the Toltecs, and these illustrate the difference between the ancient and the more modern civilization.

It appears that the Aztec cities were originally villages, not unlike the *palafittes* or lake villages, which were built upon piles over the water, and which belonged to the Stone Age.

But these cities were placed on the summits of the mountains, and were constructed by a process of transforming the slope of the mountains into a series of pyramids and platforms, which were probably surmounted by palaces, or by temples and altars, their very sightliness making them impressive objects in the landscape.

We are to notice the peculiar quadrangular arrangement of the apartments of the kings and the inclosures occupied by the priests, as well as the orientation of the pyramids, for there was a religious motive embodied in it; the worship of the sun requiring that the city be built after a certain pattern. This quadrangular arrangement has been spoken of by Mr. W. H. Holmes, who visited the ancient city of Monte Alban and traced out the plan after which it was built, in the arrangement of the great pyramidal mounds which covered the mountain sides and changed their summits into artificial shapes.

The description by Mr. W. H. Holmes is especially worthy of attention, as his experience as an archæologist would naturally lead him to be very cautious in his expressions. After speaking of his ascent of the mountain and cultivated terraces and the discovery of well-preserved quadrangular ruins arranged about a quadrangular court, he describes the scene which presented itself:

From the mainland, I ascended the central pyramid, which is the crowning feature of this part of the crest, and obtained a magnificent panorama of the mountain and the surrounding valleys and ranges. Turning to the north, the view along the crest was bewildering in the extreme. In years of travel and mountain work, I had met with many great surprises, such as that experienced on emerging suddenly from the forest-covered plateaus of Arizona into a full view of the Grand Cañon of the Colorado, or of obtaining unexpected glimpses of startling Alpine panoramas—but nothing had ever impressed me so deeply as this. The crest of Alban, one-fourth of a mile wide, and extending nearly a mile to the north, lay spread out at my feet. The surface was not covered with scattered and obscure piles of ruins as I had expected, but the whole mountain had been removed by the hand of man, until not a trace of natural contour remained. There was a vast system of level courts, enclosed by successive terraces and bordered by pyramids upon pyramids. Even the sides of the mountain descended in a succession of terraces, and the whole crest, separated by the hazy atmosphere from the dimly-seen valleys more than 1,000 feet below, and isolated completely from the blue range beyond, seemed suspended in mid air. All was pervaded by a spirit of mystery, solitude and utter desolation, not relieved by a sound of life or a single touch of local color. It seemed, indeed, a phantom city, and separated as it is by half a dozen centuries from the modern city—barely traceable as a fleck of white in the deep valley beyond the saddle of the Lesser Alban—furnishes a tempting field for speculation.

I have endeavored to convey some notion of this remarkable scene in the panorama which is constructed from a sketch made from the summit of

the central pyramid seen in the foreground of the view. The point of view assumed is indicated by a cross in the profile view of the mountain, and also by a cross on the accompanying map. In the foreground is the great terrace, referred to above, crowned by its two pyramids, one placed at the southeast corner and the other, the main mound, situated a little to the left of the centre.

Behind this group is the central feature of the ancient city, a vast court or plaza, a level, sunken field 600 feet wide and 1,000 feet long, inclosed by terraces and pyramids and having a line of four pyramids ranged along its centre. * * * The chain of pyramids extending from north to south along the middle of the great square constitutes one of the most interesting features of the remains. They are well shown in the panorama and map. In viewing these works, one is tempted to indulge in speculation as to the conditions that must have prevailed during the period of occupation. How striking must have been the effects when these pyramids were all crowned with imposing temples, when the great level plaza about them, 600 by 1,000 feet in extent, was brilliant with barbaric displays, and the inclosing ranges of terraces and pyramids were occupied by gathered throngs. Civilization has rarely conceived anything in the way of amphitheatric-display more extensive and imposing than this.

This would show that the cities at the outset, were laid out after a definite plan, and did not owe their character or shape to accidental circumstances, or even to the character of the site on which they were based. The uniformity of the Mexican architecture is very instructive on this account, as it shows that it was borrowed from an older people, rather than introduced by a savage race. It, however, shows what style was common among the barbaric races of the earth, and brings before us that type which was common in Asia many thousands of years ago. The analogies are found in the cities of the East, such as Babylonia, Ninevah, Thebes, far more than in the villages of the hunter tribes of the North, and show that they were built after an entirely different system. In this respect the early historians are more correct than some of the modern archæologists; for they described the cities as they saw them, while the archæologists depend upon only the ruined cities and a few relics and remains which are left, from which they are able to trace the plans after which they were built.

There was another advantage which the historians had over the archæologists: they all describe the scenery in such a manner as to present a perfect picture which appeals to the imagination and pleases the fancy; but the archæologists are held by the technique of their science and feel bound to give the details and measurements of each part in turn, rather than the artistic character of the whole scene. For this reason we prefer to quote the historians, and shall do so without stopping to criticise their style or correct their statements.

It is due to the Spanish historians that a picture of barbaric magnificence has been preserved and that the middle stage of human progress has been portrayed. The descriptions of costumes, equipages, house-furnishings, military equipments, mode of warfare, as well as of social habits and customs, and all the details of domestic life are worthy of careful study on this account. The most brilliant and gorgeous scenes riveted their attention, for they were as novel and strange to them as

they would be to us. Many of the objects which they saw were so fragile that they were easily destroyed, and so passed out of sight. But, the featherwork and gorgeous head-dresses which were worn by the warriors were as true signs of the barbarism which prevailed as was the strange architecture which was embodied in their temples. As Prescott says:

Architecture is, to a certain extent, a sensual gratification; it addresses itself to the eye, and affords the best scope for the parade of barbaric pomp and splendor. It is the form in which the revenues of a semi-civilized people are most likely to be lavished. The most gaudy and ostentatious specimens of it, and sometimes the most stupendous, have been reared by such hands. It is one of the first steps in the great march of civilization.*

The historians speak, to be sure, as if the warriors and chiefs belonged to an organized army, and of the tribes as if they were great nations, and of their *caciques*, or monarchs, as if they were the kings of a great empire. But this description was certainly as correct as that of the writers who have compared the people to the wild tribes of the North, and who have made the confederated cities of Mexico to resemble the Iroquois confederacy which formerly existed in the State of New York. The tribes which were situated in the valley of Mexico may have been at one time nothing more than savages, and their condition may have been no better or higher than that of the Iroquois, when they were visited by Champlain. But the vision which greeted the eyes of Cortez, as he looked down upon the valley of Mexico, was very different from that which met the eyes of Champlain when he attacked the little band of Iroquois on the shores of the lake which bears his name.

The villages, or so-called castles of the Iroquois were situated upon the different lakes which are scattered throughout the state of New York, with the chief village, where the "Long House" was situated, in the very centre of the confederacy. It was owing to the fact that they were so secure in their strongholds, and were so strong in their confederated capacity, that they became a terror to all the tribes. It did not take more than three or four centuries for either confederacy to come up to the summit of its power, but the great advance during the previous history of Mexico under the Toltecs had given to the Aztecs a civilization which was very unlike that of the Iroquois. And so the scene which greeted the eyes of Cortez, the Spaniard, was very different from that which engaged the attention of Champlain, the Frenchman. As Prescott says:

Cortez, at the very time of his landing, recognized the vestiges of a higher civilization than he had before witnessed in the Indian islands. The houses were some of them large, and often built with stone and lime. He was particularly struck with the temples, in which were towers constructed of the same solid materials, and rising several stories in height. In the court of one of these, he was amazed by the sight of a cross, of stone and lime, about ten palms high. It was the emblem of the god of rain. Its appearance suggested the wildest conjecture, not merely to the unlettered soldiers, but subsequently to the European scholars, who speculated on the character of the races that had introduced there the symbol of Christianity.

See Prescott's "Conquest of Mexico," Vol. I., p. 134.

The Mexicans had many claims to the character of a civilized community, but the detestable feature of the Aztec superstition was its cannibalism; though, in truth, the Mexicans were not cannibals in the coarsest acceptance of the word. They did not feed on human flesh merely to satisfy a brutish appetite, but in obedience to their religion. Their repasts were made of the victims whose blood had been poured out on the altar of sacrifice. Human sacrifice had been practiced by many nations, but never by any on a scale to be compared with that in Anahuac. Scarcely any author pretends to estimate the yearly sacrifices throughout the empire at less than 20,000. Indeed, the great object of the war with the Aztecs was quite as much to gather victims for their sacrifices, as to extend their empire. It was customary to preserve the skulls of the victims of sacrifices in buildings appropriated to the purpose. The companions of Cortez counted 136,000 in one of these edifices. Human sacrifices were adopted by the Aztecs early in the fourteenth century, about 200 years before the Conquest, but it was this that led to their ruin in the end.

V. With this general description of the characteristics of the ancient cities of Mexico, we now turn to give an account of the location of particular cities through which the Spanish conquerors passed, and which they have described so graphically. Various writers have drawn from the Spanish records, and have given us excellent accounts of the Conquest as well as the character of the cities. Our knowledge of the architecture which prevailed is secured from them, but has been confirmed by later explorations of the archæologists.*

Tlascala was one of the most important and populous towns on the tableland. Cortez, in his letter to the Emperor, compares it to Grenada, affirming, that it was larger, stronger, and more populous than the Moorish capital, at the time of the Conquest, and quite as well built. The truth is that Cortez, like Columbus, saw objects through the medium of his own imagination. The Tlascalans, who had been driven to the mountains and there hidden themselves behind the great wall which they had built between the mountains, making an artificial barrier to supplement that which was natural, were ready to join with Cortez in his attack upon the cities which were situated in the valley. The following description, given by Prescott, is taken from one of the old Spanish historians and furnishes a picture of the people:

The crowds flocked out to see and welcome the strangers,—men and women in their picturesque dress, with bunches and wreaths of roses, which they gave to the Spaniards, or fastened to the necks or caparisons of their horses, in the same manner as at Cempoalla. Priests, with their white robes, and long matted tresses floating over them, mingled in the crowd,

* The chief modern authorities are Prescott and H. H. Bancroft, though the explorations of Charnay, of Bandelier, and of W. H. Holmes have thrown much light on the ruined cities. These confirm the accounts of the early Spanish historians.

scattering volumes of incense from their burning censers. The houses were hung with festoons of flowers, and arches of verdant boughs, intertwined with roses and honeysuckle, were thrown across the streets.

The garments of the common people were many colored, and the multitude were arrayed in beautiful feathers. The warriors who came forth to defend the cities, were also armed with weapons which were of superior character, and their chiefs were covered with plumes and head-dresses very imposing to the sight. Each nation had its own particular standard on which were painted or embroidered the armorial bearings of the State. That of the Mexican empire, as we have seen, bore an eagle in the act of seizing a tiger or jaguar. That of the republic of Tlascala, a bird with its wings spread as in the act of flying, which some authors call an eagle; others, a bird or crane. Each of the four lordships of the republic had, also, its appropriate ensign: Tizatlan had a crane upon a rock; Tepeticpac, a wolf with a bunch of arrows in his paws; Ocotelulco, a green bird upon a rock, and Quiahuiztlan, a parasol made of green feathers. Each company or command had also a distinct standard, the colors of which corresponded to the armor and plumes of the chief. The great standard of the Tlascaltec army was carried by the general commanding, and the smaller banners of the companies, by their respective captains; they were carried on the back, and were so firmly tied that they could not be detached without great difficulty.*

The architecture of this city does not seem to have equaled that of the cities in the valley, such as Cholula, Tezcuco, and Tenochtitlan or Mexico. Still, it was of a character to surprise the Spanish conquerors. The division of the city into four quarters resembled that which prevailed in all of the Aztec cities. The following is a quotation from Prescott, which will show the degree of civilization reached:

The houses were built for the most part of mud or earth; the better sort of stone and lime, or bricks dried in the sun. They were unprovided with doors or windows, but in the apertures for the former hung mats, fringed with pieces of copper or something which, by its tinkling sound, would give notice of any one's entrance. They peculiarly excelled in pottery, which was considered as equal to the best in Europe. It is a further proof of civilized habits that the Spaniards found barber's shops and baths, both of vapor and hot water, familiarly used by the inhabitants. A still higher proof of refinement may be discovered in a vigilant police, which repressed everything like disorder among the people. The city was divided into four quarters, which might rather be called so many separated towns, since they were built at different times and separated from each other by high stone walls, defining their respective limits. Over each of these districts ruled one of the four great chiefs of the republic, occupying his own spacious mansion and surrounded by his own immediate vassals.†

The next city which Cortez visited, was the ancient city Cholula, capital of the Republic of that name. It lay nearly six leagues south of Tlascala and about twenty southeast of the City of Mexico. It was said by Cortez to contain 20,000 houses within the walls, and as many more in the environs. It was of great antiquity, and was founded by the primitive races who overspread the land before the Aztecs, and carried back the foundation of the city to the Olmecas, the people who preceded the Toltecs. It had been reduced to vassalage by the Aztecs, and its people were in frequent collision with the Tlascalans.

* See Prescott's "Conquest of Mexico."

† See Bancroft's "Native Races of the Pacific States."

The inhabitants excelled in various mechanical arts, especially that of working of metals, the manufacture of cotton and agave clothes, and of a delicate kind of pottery, rivalling, Herrera says, that of Florence in beauty. The capital, so conspicuous for its refinement, was more venerable for its religious traditions. It was here that the God Quetzalcoatl dwelt and taught the Toltec inhabitants the arts of civilization. It was in honor of this benevolent deity that the stupendous mound was erected, on which the traveler still gazes with admiration, as the most colossal fabric in New Spain. The date of the erection is unknown, for it was there when the Aztecs entered on the Plateau. It had the form common to the Mexican *teocallis*—that of a truncated pyramid, facing with its four sides the cardinal points, and divided into four terraces. The perpendicular height of the pyramid is 177 feet. Its base is 1,423 feet long, twice as long as the great pyramid of Cheops. It may give some idea of its dimensions to state that its base, which is square, covers about 44 acres, and the platform on its truncated summit embraces more than one. It reminds us of the colossal monuments of brick-work, which are still seen in ruins on the banks of the Euphrates, and, in much better preservation, on those of the Nile.

The following description is from Bancroft's "Native Races," Vol. iv., p. 484:

From a base of about 1,440 feet square, whose sides face the cardinal points, it rose in four equal stories to a height of nearly 200 feet. Traces of artificial terraces are noted on the slopes, and excavations have proven that the whole amount, or a very large portion of it, is of artificial construction. The material of which the mound is constructed is *adobes*, or sun-dried bricks, generally about fifteen inches long, laid regularly with alternate layers of clay. Col. Brantz Mayer says the *adobes* are interspersed with small fragments of porphyry and limestone, but the historian Veytia ascertained the material to be small stones and a kind of brick of clay and straw in alternate layers. * * * Bernal Diaz at the time of the conquest counted 120 steps in the stairway, which led up the steep to the temple, but no traces of the stairway have been visible in modern times. Humboldt shows that it is larger at the base than any of the Old World pyramids, over twice as large as that of Cheops, and a little higher than that of Mycerinus. He says: "The construction of the *teocalli* recalls the oldest monuments to which the civilization of our race reaches. The historical annals of aboriginal times, confirmed by the Spanish records of the Conquest, leave no doubt that the chief object of the pyramid was to support a temple." Latrobe says: "Many ruined mounds may be seen from the summit, in fact the whole surface of the surrounding plain is broken by both natural and artificial elevations."

There is no doubt that this terraced mound was a pyramid on whose summit was the ancient *teocalli* in which the Toltec priests formerly worshipped. It was probably the centre of the so-called city which Cortez entered and by stratagem conquered, though with great slaughter of the natives, and with considerable loss to his own troops. It was originally the shrine at which the nations or tribes, who dwelt in the Valley of Mexico, gathered for sacrifice,

and resembled the temple at Palenque, which was also a sacred place of the Maya race.

Torquemada says they came the distance of 200 leagues, and Sahagun, who saw the Aztec gods before the Christians had tumbled them from their pride of place, has given a minute account of the costume and insignia worn. He says:

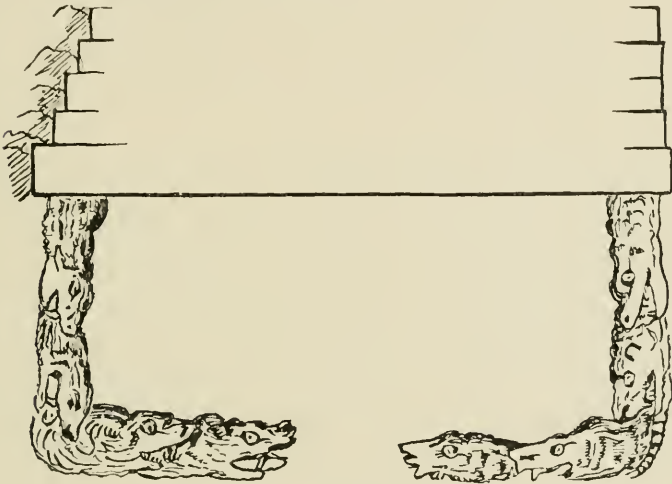
On the summit stood a sumptuous temple in which was the image of the mystic deity, god of the air, with ebon features, wearing a mitre on his head waving with plumes of fire, a resplendent collar of gold about his neck, pendants of mosaic turquoise in his ears, a jewelled sceptre in one hand, and a shield curiously painted, the emblem of his rule over the winds, in the other. The sanctity of the place, hallowed by hoary traditions and the magnificence of the temple and its services, made it an object of veneration, and pilgrims from the furthest corners of Anahuac came to offer up their devotions at the shrine of Quetzalcoatl. In no city was there such a concourse of priests, so many processions and so much pomp of ceremonial sacrifice. Cholula was, in short, what Mecca is among the Mohammedans, or what Jerusalem is among the Christians. It was the "Holy City" of Anahuac. The Aztec gods were worshipped and 6,000 victims were annually offered up at their sanguinary shrines.

Nothing could be more grand than the view which met the eye from the area on the truncated summit of the pyramid. Toward the west stretched that bold barrier of porphyritic rock which nature has reared around the valley of Mexico, with the huge Popocatepetl and Iztaccihuatl standing like two colossal sentinels to guard the entrance to the enchanted region. Far away to the east was seen the conical head of Orizaba, soaring high into the clouds, and nearer, the barren, though beautifully shaped Sierra de Malinche throwing its broad shadow over the plains of Tlascala.

At the elevation of more than 6,000 feet above the sea are the rich products of various climes, growing side by side, fields of maize, the juicy aloe, the chilli, Aztec pepper, plantations of the cactus; the land irrigated by numerous streams and canals, and well shaded by woods that have disappeared before the rude axe of the Spaniards. The Spaniards were filled with admiration at the aspect of the Cholulans; they were particularly struck with the costume of the higher classes, who wore fine embroidered mantles, resembling the graceful Moorish cloak, in texture and fashion. They showed the same delicate taste for flowers as the other tribes of the Plateau, decorating their persons with them, and tossing garlands and bunches among the soldiers. Immense numbers of priests mingled with the crowd, swinging their aromatic censers, while music from various kinds of instruments gave a lively welcome to the visitors. The Spaniards were also struck with the cleanliness of the city, the width and great regularity of the streets, which seemed to have been laid out on a settled plan; with the solidity of the houses, and the number and size of the pyramidal temples. At night, the stillness of the hour was undisturbed, except by the occasional sounds heard in a populous city, and by the hoarse cries of the priests, from the turrets of the *teocallis*, proclaiming through their trumpets the watches of the night.

The city of Mexico, called in the native language Tenochtitlan, was the largest and the most powerful of all the Aztec cities. It occupied, as we have said, an island near the centre of the lake, which was reached by three artificial dykes, one of which connected it with Tlacopan, capital of an allied tribe; a second with the city of Tezcuco, and a third with Xochimilco. These various cities were destroyed by the Spaniards, scarcely a fragment of them remains. The following description, gathered by Prescott from the early historians, is worthy of our notice:

They also saw as they passed along several towns resting on piles and reaching afar into the water, a kind of architecture which found great favor with the Aztecs. The water was darkened by swarms of canoes filled with Indians. The army kept along the narrow tongue of land, which divides the Tezcucan from the Chalcan waters, and entered on the great dyke which connected the island city with the mainland. It was the same causeway which forms the southern avenue of Mexico. The Spaniards had occasion more than ever to admire the mechanical science of the Aztecs, in the precision with which the work was executed, as well as the solidity of its construction. It was composed of huge stones, well laid in cement, and wide enough throughout its final extent for ten horsemen to ride abreast. At a distance of half a league from the capital, they encountered a solid work, or curtain, of stone, which traversed the dyke. It was twelve feet high, and was strengthened by towers at the extremities, and in the centre was a battlemented gateway, which opened a passage to the troops. After this the army reached a drawbridge near the gates of the city. It was built of wood, thrown across an opening in the dyke which furnished an outlet to the waters, when swollen by a sudden influx.



SERPENT WALL IN MEXICO.

The architecture of the city of Mexico is interesting from the fact that it shows how a village, which resembles the lake villages of Switzerland in being placed over the water and built upon piles, grew up to be a great city, with streets, houses, palaces, temples and market-places, and yet continued to be reached by canoes. The growth was rapid, and no specimens of the early stages have been preserved. This growth was due to contact with a Toltec civilization, which had preceded the arrival of the Aztecs, as well as to the resources which the valley afforded, but mainly to the occupations of the people. Mr. Prescott says:

Agriculture was the chief employment, and this resulted in the rapid development of commerce and art. There was scarcely a spot so rude, or a steep so inaccessible as not to possess the power of cultivation. * * * From the resources thus enlarged by conquest and domestic industry, the monarch drew the means for the large consumption of his own numerous

household, and for the costly works which he executed for the convenience and embellishment of the capital. He filled it with stately edifices for his nobles, whose constant attendance he was anxious to secure at his court. He erected a magnificent pile of buildings, which might serve both for a royal residence and for the public offices. It extended from east to west 1,234 yards, and from north to south 978 yards. It was encompassed by a wall of unburnt bricks and cement, six feet wide and nine feet high, for one-half of the circumference, and fifteen feet high for the other half. Within this enclosure were two courts. The outer one was used as the great market-place of the city; and continued to be so until long after the Conquest, if, indeed, it is not now. The interior court was surrounded by the council-chambers and halls of justice. There were also accommodations there for the foreign ambassadors; and a spacious saloon, with apartments opening into it, for men of science and poets, who pursued their studies in this retreat, or met together to hold converse under its marble porticos. In this quarter, also, were kept the public archives, which fared better under the Indian dynasty, than they have since under their European successors. Adjoining this court were the apartments of the king, including those for the royal harem, as liberally supplied with beauties as that of an Eastern sultan. Their walls were encrusted with alabasters and richly tinted stuccos, or hung with gorgeous tapestries of variegated feather-work. They led through long arcades, and through labyrinths of shrubbery, into gardens where baths and sparkling fountains were overshadowed by tall groves of cedar and cypress.

This palace, so graphically described, was a pile of low, irregular buildings, flanked upon one side by the wall of serpents, *coatlpantli*, which encompassed the great *teocalli*, with its little city of holy edifices. It may have embraced the apartments which were necessary for the accommodation of the great household of the Aztec monarch; all of them arranged in a quadrangular shape, but built in an unsubstantial way and of perishable material.

It will be remembered that this city, with all its grandeur, was swept out by the Spaniards in the process of a three months' siege. The point of attack selected by the Spanish general was Xochimilco, or the "field of flowers," as the name implies from the floating gardens which rode at anchor, as it were, on the neighboring waters. Prescott says:

It was one of the most potent and wealthy cities in the valley, and a staunch vassal of the Aztec crown. It stood, like the capital itself, partly in the water, and was approached in that quarter by causeways of no great length. The town was composed of houses like those of most other places of like magnitude in the country—mostly of cottages and huts made of clay and the light bamboo, mingled with aspiring *teocallis* and edifices of stone, belonging to the more opulent classes.

CHAPTER XVII.

TOLTEC CITIES AND TOLTEC CIVILIZATION.

The term Toltec has been regarded as a synonym of all that was refined and cultivated among the prehistoric races of Mexico and Central America, and is generally suggestive of a high state of civilization. This use of the word has, however, been objected to by many writers as giving an exaggerated idea of the progress of the people. Some have gone so far as to deny that there ever was a separate tribe. Dr. Brinton maintained that the name Toltec was a title of distinction, rather than a national or tribal name, and was never applied to the common people. Mr. L. H. Morgan and Mr. A. F. Bandelier maintain that there was no such state of civilization as is suggested by the name, either in this region or anywhere on the continent. What appears to be such, was only a varied form of barbarism; the so-called cities, which the Spaniards saw and the historians described, were little more than tribal villages; the kings were little else than tribal chiefs. The priests, who officiated at the ceremonies in the temples and who sacrificed human victims upon the summit of the pyramids, were not essentially different from the "medicine men" of the aborigines. Everything described by the Spanish historians as so superior, owes its magnificence to the imagination of the writers, or to their purpose to produce an effect upon the minds of the Europeans. There is very little that was real or truthful in these descriptions.

According to this school much that was written by the Spanish historians is to be rejected, and even the works of the American historians, such as Mr. W. H. Prescott, Mr. H. H. Bancroft, and others, were too much influenced by the exaggerations of the Spanish writers, and are too imaginative and visionary to be accepted.

The pendulum, however, has begun to swing in the other direction. The destructive criticism has given place to the constructive, and all are now willing to accept the statements which are made, making allowance for the circumstances and the times. The exaggerations of the Spanish historians have been trimmed off, the solid facts have come forth, and it is now admitted that after all, there was in Mexico and the Central provinces of South America, as well as in the United States of Colombia and among the mountains of Peru, evidence of civilization, which may well be compared to those which existed in many parts of the old world, at the beginnings of history, especially in India, Mesopotamia, the valley of the Nile, and perhaps in China.

There was, however, this difference between the cities of America and those of the East: these were originally the abodes of clans and tribes, but some of them were becoming subordinate to others, and so were divided into two classes—the ruling and the serving; while the cities known to history, were the seats of an empire and abodes of a despot. On this point Mr. E. J. Payne, the author of the “History of the New World Called America,” says:

The pueblo, in its simple form, possesses no historical importance. History in the ordinary sense, only begins when the pueblo has become the unit of a compound society, consisting of several such united units aggregated into a group, held in subjection by some larger and stronger one; one of a class, which may be called “dominant” or “sovereign” pueblos.

In denominating the pueblos by which others were held in subjection, “dominant” or “sovereign” pueblos, the name given to them by the Mexicans (*Tlatocaahtepetl*) is exactly reproduced.

Here, alone among the advanced tracts of the New World, we find chiefs belonging to the conquering tribes established as resident proprietors in the conquered pueblos. The Spaniards rightly compared these proprietary estates, which seem usually to have comprised the greater part of the village lands, to the seigneuries of Europe. The remarkable analogy to a familiar element in the advancement of the Old World is wholly wanting in Peru.*

This is virtually the position which Dr. E. B. Tylor takes, in his admirable work, “Anahuac; or, Mexico and the Mexicans, Ancient and Modern.” He says that “the highest grade reached anywhere was barbarism without iron or the alphabet, but in some respects simulating civilization.”

Miss Susan Hale, who has written a book upon Mexico, enters a gentle protest against the severe tendency of the critics, and laments that they, “with the fatal penetration of our time, destroy the splendid vision which was drawn by the Spaniards, and which resembled the glories of an oriental tale; reducing the emperor to a chieftan, the glittering retinue to a horde of savages, the magnificent palace to a pueblo of adobe. The discouraged enthusiast sees his magnificent civilization, devoted to art, literature, and luxury, reduced to a few handfuls of pitiful Indians quarrelling among themselves for supremacy; and sighs to think his sympathies may have been wasted on an Aztec sovereign, dethroned by the invading Spaniard.”

Later explorers, M. Désiré Charnay, Mr. and Mrs. Maudsley, Mr. W. H. Holmes and M. H. Saville, do not follow the Spanish historians, but by their descriptions they show that the cities were far more magnificent than any ordinary Indian pueblo could be, and contained many fine specimens of art and architecture. The cities, in fact, show a grade of civilization which was quite equal to that which prevailed in the East at the opening of history. They are scattered over a wide region of country, some of them in Mexico, some in Guatemala, Nicaragua, and Honduras; those in Mexico having been erected

* “History of America,” Vol. II., page 51

at different periods and by different tribes of the great Nahua race.

These cities are to form the subject of the present chapter, especially those which have been ascribed to the Toltecs, for we maintain that there was a great difference between the Toltec cities and those which preceded and followed; and they may be taken as certainly furnishing the best specimens of art and architecture to be found in Prehistoric America. There may be some who will deny this, and who will refer to the Maya architecture as superior; but there was so much difference between the two styles that they cannot very well be compared. The superiority of the Toltec architecture, in some particulars, can be easily shown, while that of the Mayas in others will be readily granted.

The Toltecs built many high pyramids, arranged in quadrangles, for foundations of their temples and palaces, but the buildings were of perishable material and have disappeared. The Mayas built terraced platforms which were broad and spacious, and erected their palaces and temples upon these, but always used stone as the building material. They frequently ornamented the façades with elaborate figures carved upon the stone. These figures consisted sometimes of massive serpents and sometimes of conventional ornaments.

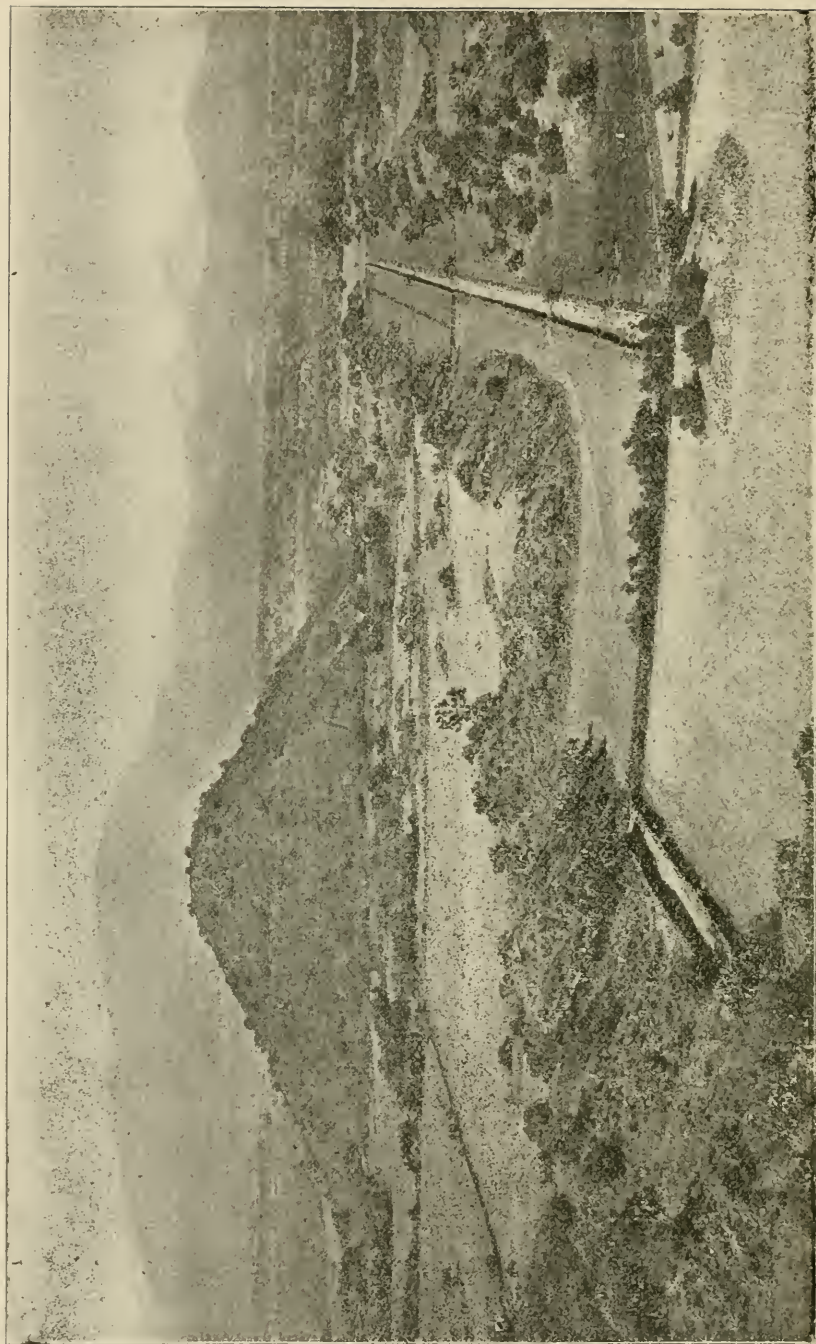
Matthew's says in his book on Architecture :

Palaces and temples are the main survivals of native art. The palaces, as a rule, were low, one-story buildings, without windows, rising above one or more terraces. Each was composed of a stone basement, surmounted by a species of attic, carved in imitation of reeds and decorated in high relief with scrolls, monsters, and masks, such as are used on the prows of battle-ships among the Polynesian Islanders. The roofs were flat and the rooms were lighted only from the doors.

The point which we desire to bring out, is that there was a Toltec architecture which was as distinctive as was ever the Etruscan, the Mycenæan, the Persian, or the Babylonian; and the term may be ascribed to it, without deciding whether there was any particular tribe or people called by that name. The significance of the name is, that it expresses that stage of civilization which was reached at an early date in America, and which may well be compared to that which prevailed in the countries of the East many thousands of years before.

I. The first point which we shall bring up is that there were, in Mexico, certain tribes which were of a superior character and which showed a fair degree of civilization. The origin of these tribes, as such, has not been discovered, but Mr. Bancroft has given a valuable history of them, of which the following is a brief summary :

The history of the native races may be most conveniently subdivided, as follows: 1st. The Pre-Toltec period, embracing the semi-mythic traditions of the earliest civilization, extending down to a date—always preceding the sixth century, but varying in different parts of the territory—when the more properly historic annals of the different nations begin, and



SAN JUAN TEOTIHUACAN FROM THE PYRAMID OF THE MOON.
Courtesy of the Field Columbian Museum.

including also the few traditions referring to pre-Toltec nations north of Tehuantepec. 2nd. The Toltec Period, referring like the two following periods to Anahuac alone, and extending down to the eleventh century. 3rd. The Chichimec Period, extending from the eleventh century to the formation of the tri-partite alliance between the Aztecs, Acolhuans, and Tepanecs in the fifteenth century. 4th. The Aztec Period, that of Aztec supremacy during the century preceding the Conquest.

The old-time story, how the Toltecs in the sixth century appeared on the Mexican tableland; how they were driven out and scattered in the eleventh century; how after a brief interval the Chichimecs followed their footsteps, and how these last were succeeded by the Aztecs, who were found in possession,—the last two, and probably the first, migrating in immense hordes from the far Northwest,—all this is sufficiently familiar to readers of Mexican history.

Tradition imputes to the Toltecs a higher civilization than that found among the Aztecs, who had degenerated with the growth of the warlike spirit, and especially by the introduction of more cruel and sanguinary religious rites. But this superiority, in some respects not improbable, rests on no very strong evidence, since this people left no relics of that artistic skill which gave them so great traditional fame; there is, however, much reason to ascribe the construction of the pyramids at Teotihuacan and Cholula to the Toltec, or a still earlier period. Among the civilized peoples of the sixteenth century, however, and among their descendants down to the present day, nearly every ancient relic of architecture or sculpture is accredited to the Toltecs, from whom all claim descent.

During the most flourishing period of its traditional five centuries of duration, the Toltec empire was ruled by a confederacy similar in some respects to the alliance of the later date between Mexico, Tezcuco, and Tlacopan. The capitals were Culhuacan, Otompan, and Tulan, the two former corresponding somewhat in territory with Mexico and Tezcuco, while the latter was just beyond the limits of the valley toward the northwest. Each of these capital cities became in turn the leading power in the confederacy. Tulan* reached the highest eminence in culture, splendor, and fame; and Culhuacan was the only one of the three to survive by name the bloody convulsions by which the empire was at last overthrown, and retain anything of her former greatness.

Before the Chichimec invasion, Cholula had already acquired great prominence as a Toltec city, and as the residence of the great Nahua apostle Quetzalcoatl, of which era, or a preceding one, the famous pyramid remains as a memento.

The coast region east of Tlascala, comprising the northern half of the State of Vera Cruz, was the home of the Totonacs, whose capital was the famous Cempoala, and who were conquered by the Aztecs at the close of the fifteenth century. They were probably one of the ancient pre-Toltec peoples, like the Otomis and Olmecs, and they claimed to have occupied in former times Anahuac and the adjoining territory, where they erected the pyramids of the sun and moon at Teotihuacan. Their institutions, when first observed by Europeans, seem to have been essentially Nahua, and the abundant architectural remains found in Totonac territory, as at Papantla, Misantla, and Tusapan, show no well-defined differences from Aztec constructions proper.†

We learn from these descriptions that there were many Toltec cities scattered through the provinces of Mexico, the most of which are now in ruins; but from the ruins, the characteristics of the Toltec architecture can be discovered.

*The ruins of Tulan were discovered by Monsieur Desire Charnay, and are described in his interesting book on "The Ancient Cities of the New World," pages 103 to 212.

† Bancroft's "History," Vol. II., pages 113 and 114.

These ruins have been examined by various explorers and have proved to contain many elements of architecture which resembled those found in the ancient cities of the Mayas of Central America.

A description of these cities has been given by the different archæologists, whose names have been mentioned above, and photographs, panoramas, and diagrams have been taken of them; so that we may now easily compare their arrangements, their architectural features, and their various peculiarities with those which prevailed in other countries of the East, as well as those in Central America.

II. Among the elements which constitute the chief factors in these cities, we may mention, first, their division into parts resembling wards, each part having a central temple; all the parts arranged around the palace and the temple, which were the seats of authority for the ruling classes, who corresponded to the kings and priests in Oriental countries. In some of the cities, orientation was manifest, the sides of the temples being directed to the points of the compass. The stairways which reached the temples faced the four quarters of the city. The arrangement of these cities around the palaces and temples, shows that society had passed out from the village life and the clan-organization, into a stage in which a certain class had usurped a power over the other classes, and had elevated the central village into supremacy over other villages; making the whole agricultural country surrounding tributary to the city, and subject to the control of the chiefs, who had assumed the position of a king, the power of the monarch being supplemented by the priests.

This arrangement of the cities in America resembles that which was common in the Oriental countries, and differed entirely from that which prevailed in the villages of the north. The following are the particulars in which the resemblance is very close:

We find in Babylonia that there was, at a very early date, a geographical division, which arose partly from their religious system and partly from their social organization. Rev. O. D. Miller says:

In the system of symbolical geography which centered in Akkad, the capital of the country ruled by the ancient Sargon, we find a peculiar arrangement, properly illustrated by the figure, the inclosed square facing the cardinal points—denotes the position of the city as situated precisely in the centre of the world, and surrounded by four other countries, located in the direction of the four cardinal regions. Dr. Bahr calls this the ancient “cosmos” or “macrocosm.” The number 5 in the centre of the square symbolized the “soul of the world,” while the other numbers denoted the various elements—four male and four females.

—	1	—
4	5	2
—	3	—

M. Lenormant says:

To find the origin, it is necessary to go back to the common source of primitive tradition respecting the terrestrial Paradise considered as a plateau of a square figure, having its sides turned to the four cardinal

points and surrounded by the four other countries facing the cardinal regions.

Dr. Bahr says :

It is a conception common to all the ancient nations, and inseparable from their notion of God—to represent the world as a building or house to the Deity, and the Heaven as his especial dwelling. The Universe is the real, true Temple, built by the Deity himself, and this, as the original Temple, constituted a model the archetype of all those constructed by man.

The Chinese have a similar arrangement of the division of their cities, as they place the throne of the Emperor at the centre, and the temples at the corners.

The division of China into nine provinces and the symbolical

1	2	3
4	9	5
6	7	8

conceptions connected with them, date from a high antiquity, and really comes from orientation. It springs very naturally from the doubling of four and making the throne the centre of the diagram, with eight squares.*

The "Celestial Earth" and the "Crown of Heaven," which are terms common among the Chinese, are exactly the same as the old Accadian expressions which were used in Babylonia. The primitive character of the pyramid temple is seen in that it was called the foundation of the "Celestial Earth," but represented the "Sacred Mountain," which was supposed to unite the Heaven and Earth like a vast column or pyramid; this mountain, rising in immense terraces until its summit reached the Heaven, was supposed to be the pivot of the skies.

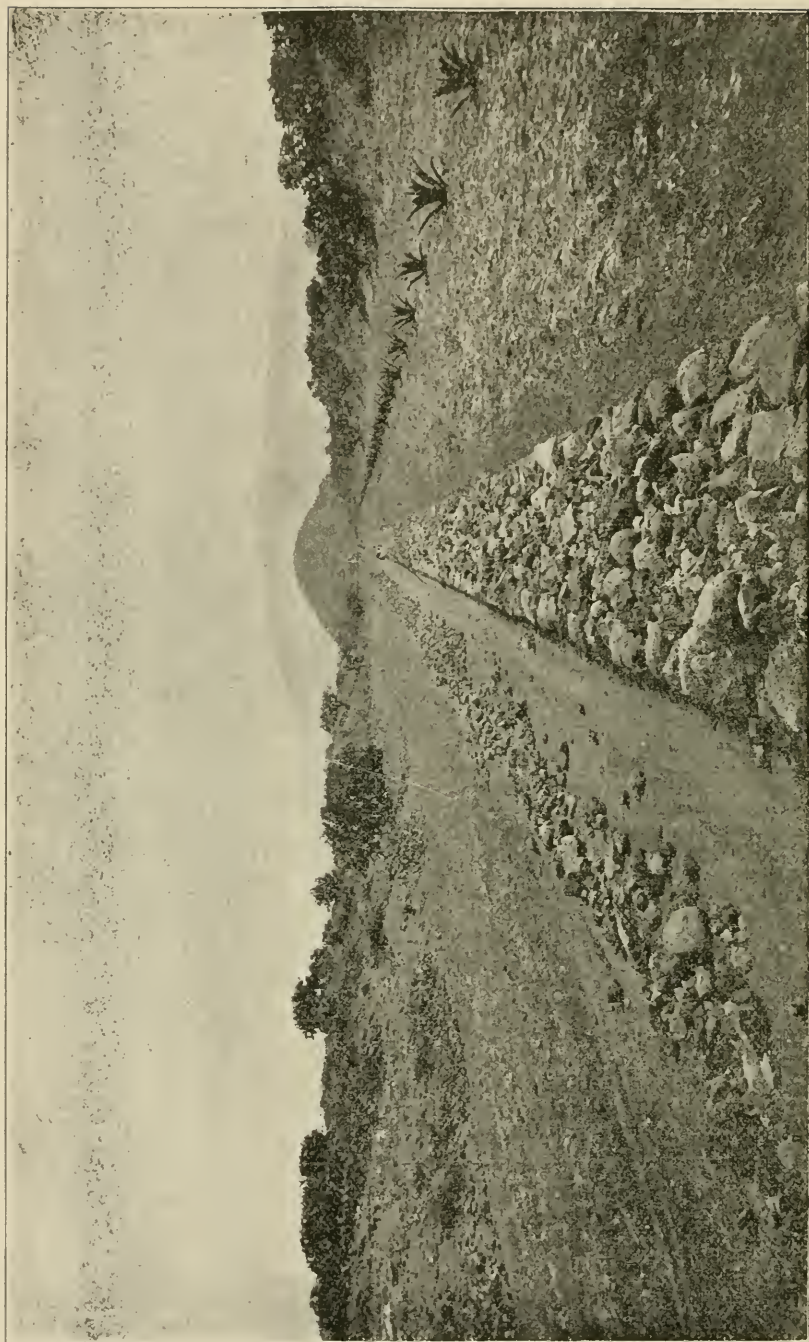
In Mexico, the ancient cities were oriented in the same way, but they seem to have controlled a limited territory, rather than an entire empire. There was, however, this peculiarity about them, they ruled over the surrounding region, and made it tributary to the city and subject to the control of the king and priests.

It has been shown, by Miss Nutall, that the priests directed the employments of the agricultural people according to the calendar, which they studied and interpreted as containing the commands of the chief divinities, who were only the nature powers personified. By this means all agricultural employments and all trade, as well as all social customs and domestic affairs, were regulated by the calendar. This, of itself, makes the architecture of the ancient cities very significant, for the temple in which the calendar stone was kept was the seat of as much power as the palace itself.†

There are strong indications proving that the different branches of industry or pursuit are identified with certain day signs. There was a division of products into four categories, according to the elements with which each industry or pursuit was connected; that on the market days of Catl, the god of water, aquatic or vegetable products; on Tecpatl (flint) days,

* See THE AMERICAN ANTIQUARIAN, Vol. III., page 113.

† See "Native American Symbolism," page 428; chapter on "Ancient Codices and Calendar Stones."



VIEW LOOKING EAST ALONG THE PATHWAY OF THE DEAD.
Courtesy of the Field Columbian Museum.

mineral products; on Calli (house) day, all manufactured articles; on Tochtli (tiger), all products of animal life should predominate in the market place.

It is maintained that there were gardens filled with trees and plants, and menageries for all kinds of wild animals, with cages for birds, in Mexico, and that the king was attended with a great retinue of servants, that his garments were highly wrought and were new each day. Gold and silver were abundant.

There are no actual proofs that these things existed in the Toltec cities, yet, judging from such specimens of art as have been discovered and from the size and character of the ruins of the cities, we conclude that all of these evidences of civilization prevailed among the Toltecs.

The ruins of aqueducts have been discovered near the City of Mexico. Aqueducts have been also recognized near the cities of Peru. No such works have been discovered in connection with the Toltec cities, yet it seems probable that they prevailed.

The division of labor and the differentiation of architecture are factors which can be recognized in the history of the Toltecs. It is plain that the people had passed from the pastoral into the agricultural state, and that the villages had grown into cities, and that there were artisans as well as rulers in the cities.

Ihering says: "No nation devoted to agriculture, but ultimately builds up towns which accomplish much in the way of promoting culture. The agriculturalist of remote ages, provided all his own necessities, but the course of man's industry gave rise to certain handicrafts which required special skill."

The arrow-maker was the first artisan, then the pottery maker, then the basket-maker and the weaver of cloth. Afterwards there would be the silversmith, the stone-mason, and the carpenter: finally, the architect. These would naturally gather into the towns and cities. We learn from history that paper was manufactured and that many finely wrought articles of gold, silver, and copper, were common in Mexico at the time of the Conquest. There is no doubt that all of these industries were carried on by the Toltecs.

This fact throws much light upon the ancient customs of the Toltecs, and makes the resemblance between the ancient cities of America and those of Babylonia all the more striking.

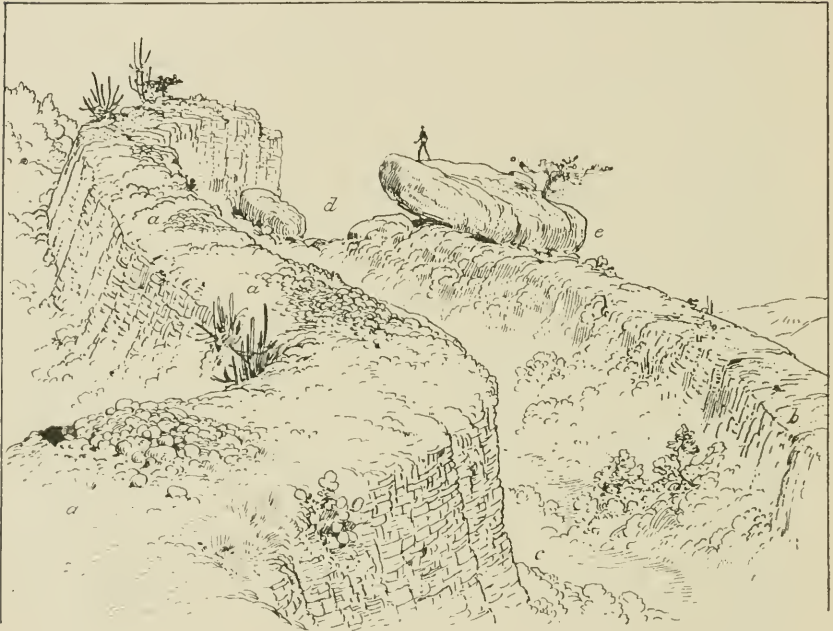
We are to notice however, in connection with these cities, that there were roadways, which extended from their centre in different directions to the agricultural country surrounding, and these became important thoroughfares, but ended at the temple and at the palace.

Descriptions have been written of the roadways in the City of Mexico by Prescott and other historians. These extended across the lakes, and separated the fresh water from the salt water and formed great causeways, which connected the island city with the shores of the lake, and so with the neighboring

cities. There were, however, other cities in Mexico, Central America, and even in Peru, which were the seats of empire and which were reached by roadways which were even more skillfully wrought and carefully attended than those of Mexico.

There were also, as we have seen, remarkable gateways in this region, to which the name of "Toltec Gates" has been given. These gateways were to be sure generally connected with fortresses, but they differed so much from those of the temples of Mexico and of the cities of Peru, as to be distinctive.

One such gateway has been described by Mr. W. H. Holmes as situated near Mitla; other similar gateways were common



TOLTEC GATE. FORTIFICATION, NEAR MITLA.

a, a, a. Inner wall with heap of stones intended for use in defense. b. Outer wall.
c. Space between walls. d. Gateway. Height of walls from 10 to 16 feet.

among the Mound-Builders of Ohio. They consisted in the overlapping of the walls of the fort in such a way, as to make a narrow, crooked passage, exposed to the missiles of those who might stand upon the walls.

The most interesting city is Quemada, situated in southern Zacatecas, not far from the northern border of Mexico. This city has long been in ruins, but was probably built by the Toltecs, a race which preceded the Aztecs and are supposed by some to have abandoned the region at the advent of this wild tribe, which came from the North, and finally settled in

the valley of Mexico and usurped the power over all the neighboring tribes. A description furnished by Mr. Bancroft was drawn from some of the early explorers, and is very important, for it shows the similarity between this ancient city and the city of Teotihuacan, which has recently awakened so much interest, because of the number of ancient pyramids contained in it, and especially because of the ancient roadway to which the name "Path of the Dead" has been given.

The following is Bancroft's description of Quemada: "The most important of famous ruins of the whole northern region are those which are known to the world under the name of Quemada, in southern Zacatecas. The ruins are mentioned by the early writers as one of the probable stations of the migratory Aztecs. The early name is "Los Edificios."

Sr. Gil says: "These ruins are the grandest among us after those of Palenque, and on examining them, it is seen that they were the fruit of a civilization more advanced than that which was found in Peru at the time of the Incas, or in Mexico at the time of Montezuma."

Bancroft describes the situation, and says:

The Cerro de los Edificios is a long, narrow, isolated hill, the summit of which is over half a mile in length from north to south, and 100 to 200 yards wide, except at the northern end, where it widens out to about 500 yards. The height of the hill is given by Lyon as from 200 to 300 feet, but by Burkhardt at 800 to 900 feet above the level of the plain. In the central part is a cliff, rising about thirty feet above the rest of the plateau. From the brow the hill descends more or less precipitously on the different sides, for about 150 feet, and then stretches in a gentler slope of from 200 to 400 yards to the surrounding plain. On the slope and skirting the whole circumference of the hill, except on the north and northeast, are traces of ancient roads crossing each other at different angles, and connected by cross roads running up the slope with the works on the summit.

One of the roads has traces of having been inclosed or raised by walls, whose foundations yet remain; and from it at a point near the angle of the raised causeway, 93 feet wide, extends straight up the slope northeastward to the foot of the bluff. From a point near the junction of the road and causeway, three raised roads, paved with rough stones, extend in perfectly straight lines southwest, and southwest by south. The first terminates at an artificial mound across the river. The second extends four miles to the Coyote Rancho, and the third is said to terminate at a mountain, six miles distant.

Two similar roads, thirteen or fourteen feet wide, extend from the eastern slope of the hill; one of them crossing a stream and terminating at a distance of two miles in a heap of stones [shrine?].

The most numerous and extensive ruins are on the southern portion of the hill, where the part of the uneven surface is formed into platforms, or terraces, by means of walls of solid masonry; the whole structure being twenty-one feet wide, and of the same height. On the platforms thus formed are a great number of edifices in different degrees of dilapidation.

On the lower part of the mesa, near the head of the causeway, is a quadrangular space, measuring 200 x 240 feet, bounded by a stone terrace, or embankment, four or five feet high and 20 feet wide. At one point, on the eastern terrace, stands a round pillar, 19 feet in circumference and of the same height as the wall—18 feet. There are visible traces of nine other similar pillars, seemingly indicating the former presence of a massive column-supported portico. Within the walls of the inclosure, 23 feet from the side, 19½ feet from the ends, is a line of 11 pillars, each 17 feet in circumference and of the same height as the walls. There can be little doubt that

these columns once sustained a roof. The roof was made of large, flat stones, covered with mortar and supported by beams.

In another place we have a square inclosure similar to the one described. Its sides are 150 feet, bounded by a terrace 3 feet high and 12 feet wide, with steps in center of terrace of each side. Back of the terrace, on the east, west, and south sides, stand walls 8 or 9 feet in thickness and 20 feet high. The north side of the square is bounded by the steep side of the central cliff, in which steps or seats are cut in some parts in the solid rock, and others built up with rough stones. In the centre of this side, and partially on the terrace is a truncated pyramid, with a base of 38 x 35 feet, and 19 feet high, and divided into several stories. In front of the pyramid, and nearly in the center of the square, stands a kinds of altar or pyramid, seven feet square and five feet high. A very clear idea of this altar is given in the cut. It presents an interior view, from a point on the southern terrace—the pyramid in five stories, the central altar, the eastern terrace with its steps, and standing portions of the walls are all clearly portrayed.

Bancroft says further:

The ruins of Quemada show but few analogies to any of the southern remains, and none whatever to any that we shall find further north. As a strongly fortified hill, bearing also temples, Quemada bears considerable resemblance to Quioitepec in Oajaca; and possibly the likeness would be still stronger, if a plan of the Quioitepec fortifications were extant. The massive character, number, and extent of the monuments show the builders to have been a powerful and, in some respects, an advanced people, hardly less so, it would seem at first thought, than the people of Central America; but the absence of narrow buildings, covered by arches of over-lapping stones, and of all decorative sculpture and painting, make the contrast very striking.

The pyramids, so far as they are described, do not differ very materially from some in other parts of the country; but the location of the pyramids shown in the drawing and plan, within the inclosed and terraced squares, seems unique. The pillars recall the roof structures of Mitla, but it is quite possible that the pillars of Quemada supported balconies, instead of roofs. The peculiar structure, several times repeated, of two adjoining quadrangular spaces inclosed by high walls, one of them containing something like an altar in the center, is an important feature.

While Quemada does not compare, as a specimen of advanced art, with Uxmal and Palenque, and is inferior, so far as sculpture and decoration are concerned, to most other Nahua architectural monuments, it is yet one of the most remarkable of American ruins, presenting strong contrasts to all the rest, and is well worthy of a more careful examination than it has ever yet received.*

Now, we have dwelt on this description of Quemada, because of its resemblance to the ancient cities of the Mayas, such as Palenque, Uxmal, and Chichen-Itza. The city seems to have contained a fortified citadel and temple, very much as the Eastern cities did; the paved causeways may be regarded as the principal streets, on which the habitations of the people were built of perishable material, and in this respect reminding us of the City of Mexico. The platforms, pyramid, and altar resemble those at Palenque. The rectangular courts are similar to those which were common in all the ancient cities of this region.

The presence of columns at this ruin of Quemada is important, for the same features are prominent in the ruins at Mitla, a city situated at the extreme southern limits of Mexico,

* See Bancroft's "Native Races of the Pacific Coast," Vol. IV., page 502.

as Quemada is near the northern limit. This shows that a style of architecture prevailed during the Toltec period throughout this entire province, and that nearly all the cities contain about the same elements. The ornamentation of the walls at Mitla is very different from any that was discovered in the other ruins, and yet the city of Xochicalco has a building whose façade is covered with grotesque ornaments, which, perhaps, show as much skill and culture as that shown at Mitla.

III. The comparison between this ruined city and others which have been ascribed to the Toltecs will be, perhaps, suggestive. The first city which comes to notice, is Teotihuacan, which Mr. W. H. Holmes has explored and has published a description of in the Report of the Field Columbian Museum. The following is his account:

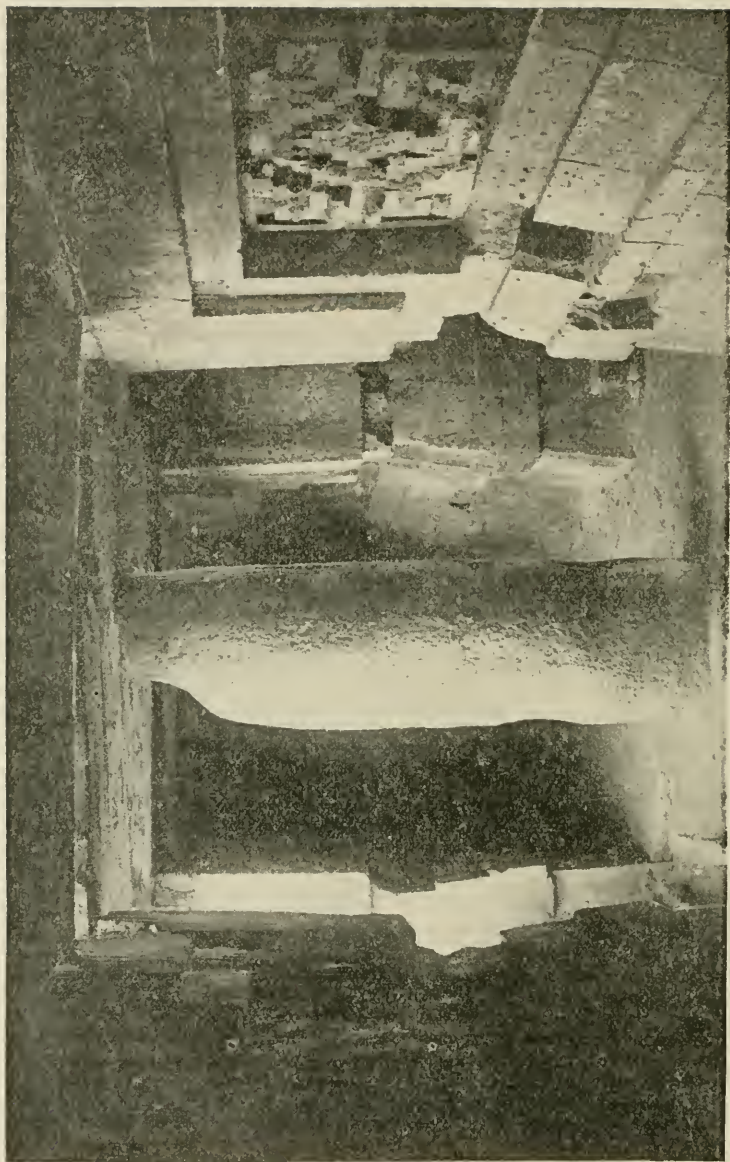
In the magnitude of its remains, and in the evidence the site furnishes of population and antiquity, Teotihuacan stands easily at the head of the ancient cities of Mexico. The bulk of the great cluster of pyramids, terraces, and mounds is far in excess of that of any other group of remains. Cholula has a greater pyramid, but lacks the multiplicity of attendant structures, which at San Juan cover square miles of ground. If the entire mass of the ruined structures of either Chichen-Itza, Uxmal, or Mitla was to be heaped up in a single mound, it would hardly surpass the great pyramid of the Sun alone in bulk, and the whole bulk of the Teotihuacan remains is many times that of its chief pyramid. Of the history of this great center of population and culture, we have hardly a trace, save that furnished by the remains themselves. The building of the city has been attributed to the Toltecs, but we cannot safely say more than that the builders were probably one of the numerous Nahuatl nations. The art remains indicate a culture differing decidedly from that of Tenochtitlan, the Aztec capital, now the capital city of Mexico, differing from it in so many ways, as to warrant the inference of a distinct nation.

In the laying out of Teotihuacan there is more evidence of foresight, than in most of the ancient cities. Though the orientation is not accurate—showing an error of about fifteen degrees—the important features are arranged in more or less complete harmony above a great artery-like thoroughfare called "The Camino de los Muertos," "The Pathway of the Dead."

The two great pyramids stand in a class by themselves, entirely overshadowing the multitude of piles that cover the plain. These pyramids, as well as other pyramidal masses, were probably substructures for buildings. All were truncated and ascended by stairways, and the sides of the loftier were generally terraced.

The Pyramid of the Moon occupies the immediate foreground in the panorama, A, and though now somewhat rounded in contour, from crumbling above and accumulation of débris below, the original form was evidently that of a rectangular, truncated pyramid. The base of the mound measures about 450 feet from north to south, and 500 feet from east to west; the truncated summit is not far from 50 x 60 feet. The sides sloped originally at an angle of about 45 degrees, and were interrupted by narrow terraces, now barely traceable. Early visitors mention the occurrence of remnants of a stairway on the east side, and indefinite references are made to a building on the summit. The summit commands a splendid view of the ruin group, and in the palmy days of the great city the spectacle from this point must have been imposing indeed.

The vast mound of the Pyramid of the Sun, B, surrounded by its associated remains, is the most imposing structure in America. With its rounded outlines and the massiveness of a natural hill, it yet presents on close inspection clear indications of its former wholly artificial and symmetric character. It is a truncated pyramid, nearly 180 feet high above its



BASEMENT GALLERIES AND COLUMNAR ROOF SUPPORT AT MITLA.
Courtesy of the Field Columbian Museum.

immediate base, and, perhaps, a little more than that above the floor of the Pathway of the Dead, or the general level of the plain. It is about 700 feet square at the base, though the measurements given are hardly more than estimates, as the lower parts are covered with vast accumulations of débris. The slopes did not vary greatly from 45 degrees, though now appearing much less than that. Terraces are still seen at three levels: that on the west side, facing the Pathway of the Dead, occurs nearly midway in the slope, and is between 20 and 30 feet wide; the others are quite narrow. The summit is not far from 100 feet square, but is now too much broken down to be accurately measured. Remains of a zig-zag stairway are said to have been observed on the east face, but as with the other pyramid, analogy would lead to the surmise that the real stairway was on the west side, thus giving a more direct descent from the summit temple, which we assume must have existed, to the great central artery of the city.

An important feature of the ancient city was the great Court of the Battered Goddess, lying at the south base of the Pyramid of the Moon and opening into the Pathway of the Dead. It is 600 or 700 feet square, and is surrounded by a line of imposing mounds, above which, on the north, towers the Pyramid of the Moon. Near the centre is a low mound, the



PANORAMIC VIEW OF TEOTIHUACAN.

wreck of an inferior pyramid, whose position would indicate that in former days it probably had an important part to play in the affairs of the city.

Opening out of the great court to the south is the so-called "Pathway of the Dead." A depressed way, varying from 200 to 300 feet in width and extending a little west of south (15 degrees) to the Arroyo of the Rio San Juan, and continuing beyond into the fields surrounding the modern village, a distance of nearly two miles. Though this pyramid-bordered way presents the appearance of a roadway, it is not truly a thoroughfare, being crossed by low embankments and interrupted by pyramids at several points. The name given appears to have no particular significance, yet it serves in a way to express the idea, suggested to all minds, that this pathway, in connection with the court, must have been the scene of no end of rites and pageants in which human sacrifice was possibly a central feature.

The South Side Group or Citadel. The great quadrangular group named and the citadel, *E*, lies on the east side of the Pathway of the Dead, 500 or 600 feet south of the banks of the Arroyo. It consists of a rectangular inclosure, about 1,350 by 1,400 feet in extent, measured around the exterior base. The embankment is from 100 to 180 feet wide, and from 10 to 20 feet in height; the four sides are surmounted by lines of mounds, four on a side, placed somewhat unsymmetrically near the altar margin. Within the court, near the east side, stands a pyramid, perhaps 200 feet

square at the base, and 60 feet high, having a projection or terrace built against the west base, while low embankments extend north and south from the pyramid connecting it with the inclosing ridge. This grand group of structures is in an advanced state of ruin, the crumbling piles having been reduced to natural profiles by centuries of cultivation and herding, and no traces of the superstructures, which must once have crowned the pyramids, are now to be seen. Everywhere there are scenes of ancient occupation.

The sketch for the Panoramic View was made from the summit of the Pyramid of the Moon. This monument is made to appear in its proper relation to its associates, and occupies the immediate foreground, A. At the left, rising grandly above its cluster of terraces and attendant pyramids, is the Pyramid of the Sun, B. The pyramid-bordered court of the Battered Goddess, C, appears behind the Pyramid of the Moon, and leading out of this and extending far away toward the south is the Pathway of the Dead, and beyond the Pyramid of the Sun, on the southern bank of the Arroyo of the Rio San Juan, is the noble group called the Citadel, E. The course of the Rio San Juan, which runs to the west—that is, to the right in the picture—is indicated by the letters F, F, and the Cathedral of the Village of San Juan appears at G. The object of the panoramic sketch is to give a map-like clearness and completeness to the view, while the photograph serves to record details of actual appearance. It should be observed, however, that the photographic views do not bring out the minor works to advantage, as they are obscured by culture features.

The city of Mitla, situated on the southern borders of Mexico, best illustrates the Toltec architecture. The ruins of this city have been described by various explorers and seem to present all the features which were peculiar to other Toltec cities, with some that were peculiar to the Maya cities in Guatemala and Honduras. Among the most notable feature in this city are the massive columns, which were used for the support of the roof, and in some cases to support the floor of the main apartment. In this respect they resemble the columns which were found at Quemada, and at the same time resemble the columns found at Chichen-Itza and Palenque, but differ from them in this respect: they are placed inside of the walls, instead of outside, as in the Maya cities.

Another feature of the architecture at Mitla is, that the walls are highly decorated with sculptural stones, which present various conventional ornaments resembling the Greek fret. The description of these ornaments and of the general construction of the city will be given at a future time, though attention is called to them here as furnishing one more specimen of the far famed Toltec culture.

CHAPTER XVIII.

ARCHITECTURAL STYLES IN THE OLD AND THE NEW WORLD.

We have spoken of the ruined cities of America, and have described those which were erected by the Aztec and the Toltec tribes and shown their characteristics; but have not yet fully described the architectural styles which were embodied in them.

We take up this for our present subject, but shall draw a comparison between the cities of America and those which have recently been discovered in the ancient lands of the East—in Babylonia, in Syria and Greece, and the islands of the sea.

I. We shall first speak of their geographical situation and their general characteristics. It is well known that the cities of America are confined to certain belts of latitude, which correspond in a certain degree to those in which the older cities of the East are to be found. There is a significance in this, for it proves that all the nations of the earth have had to struggle with the obstacles which nature planted in their way; but that those nations which were situated where the mere struggle for existence was so severe have remained in a barbaric or savage condition, while those that dwelt in the midst of rich plains, where climate and soil favored their progress, have always been the first to reach a high grade of civilization. In these localities we find that art and architecture made their most rapid growth.

It will be understood that the cities of the Old World were situated in the midst of rich valleys, where the means of subsistence were easily gained, where a large population could be supported free from attack, and where diversity of employment could be followed without disturbance. Such was the case with the cities in Babylonia, in Egypt, in Syria, Epirus, and the regions about the Mediterranean Sea. The ruined cities of America are also found on those rich plains, where vegetation is abundant and where the means of subsistence are numerous. In fact some of the cities are surrounded by vegetation which is so rank that it immediately grows up after explorers have removed it for the sake of getting a view of the ruins, and new explorers have to do the work over again.

Another feature is to be noticed: these ancient cities of the Old World were built near where there was an abundant

water supply, and generally upon rivers which furnished facilities for commerce as well as agriculture. It is well known that in Babylonia and Egypt irrigation had reached a high stage of perfection. The plains were covered with a net-work of canals, the remains of which are to be seen to this day. There was no irrigation practiced either in Greece or Syria, but the streams were numerous and the water supply abundant.

The cities of America were also situated where there was an abundant supply of water. Such was certainly the case in Mexico and Peru. The cities of Central America were not so well supplied, but they were always near some stream, or around some cenote or great well, which because of its water supply became sacred. It was the most important object, and often received offerings of gold and silver and precious stones, and even human bodies were thrown into them.

II. The commercial advantages of the ancient cities was important. It will be noticed that they are all near some sea,

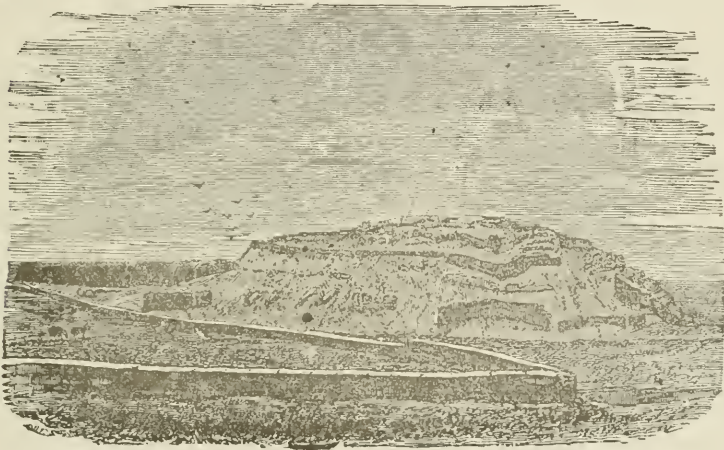


ACROPOLIS AT ATHENS.

or near some water course. Many of them were in the midst of rich plains which were capable of being irrigated, and all were in localities where there were many resources, so that their wealth and power rapidly increased. We need not dwell upon this point, for it is well known that the cities of Egypt were upon one side of the Mediterranean, those of Greece upon another, Syria on a third, and between them were the islands upon which many remarkable cities have recently been discovered, such as Crete, Knossos and Cyprus. The cities of Babylonia were upon the Tigris, but were connected with those upon the Red Sea in eastern Africa upon one side, and those of India upon the other. The lines of communication being open to the coast of Asia upon the northeast, and northwest even reaching up as far as the borders of China

In America the cities were also near great bodies of water,

the Pacific upon one side, and the Atlantic and Gulf of Mexico on the other, and were in the midst of rich lands which could be cultivated by irrigation. The agricultural products united with the fruits gathered from the tropical vegetation made it very easy to secure, not only the necessities of life but the luxuries. One can easily see how that in America there could have arisen a form of civilization perfectly independent of any other, and that great progress in art and architecture might have been made without aid from any source. And yet the fact that there are so many resemblances between the styles which appeared here and those which were common in the eastern hemisphere, has led many to believe that there was a contact in prehistoric times. This conviction is based not so much on the fact that there were here such common things as boats, bridges, aqueducts, canals, roadways, and fortified places, but in the general arrangement and group-



HILL FORTRESS IN PERU.

ing of buildings, the styles of ornamentation which appeared upon them, and especially the symbols which were embodied in their altars, temples, palaces and other buildings. Whatever we may say as to the antiquity of man upon this continent and the date at which architecture made its first appearance, yet we must look to the cities of the East for the first history of architecture and for its beginnings. Still we find the elements of architecture here, for many of these cities contain great buildings which are furnished with doorways, cornices, columns, coping, and roofs, all exhibiting a high degree of art; some of them are covered with sculptured figures, and occasionally with hieroglyphics, which show that much advancement had been made in art and architecture among the people.

The buildings in these cities showed a great variety of styles and uses, for there were palaces and temples, and shrines

and religious houses filled with courts and halls and many apartments; the ground plan of the palaces being almost identical with those which represent the ancient palaces of the East, and the arrangement or grouping of the palaces and temples, towers and courts being very similar. These cities are silent, and we must depend upon our imagination to realize the life which formerly existed. When, however, we read the history of those cities which the Spaniards discovered, and which were inhabited at the time they reached the continent, it becomes easy for us to rehabilitate them, and to fill them again with a life which has long since passed away. When we look upon the ruins which are scattered over the land, and see in them the signs of magnificence and wealth which prevailed, we are led to believe that the accounts of the early historians have not been exaggerated, for every city seemed to be full of palaces, temples, and halls, which were covered with barbaric ornaments, indicating that the ruling classes had great power over the common people. Near these palaces were courts and plazas, within which were statues, sculptured columns and tablets, which show that pride and luxury prevailed along with great wealth, exactly as in Oriental lands.

We have the record of Belshazzar's feast and the destruction which came upon the city of Babylon; we have, also, the story of Queen Esther, who, of all the women contained in the harem of the great monarch, was willing and able to save her own people from destruction; but the opinion is that in the great cities of America the same despotism was exercised by the ruling classes over the common people. Luxury and pride continued, and the resources of the land were taxed to the very utmost. The whole land was given over to its thralldom and the same calamity came upon the people that afterward came to the northern kingdom at the advent of the Spaniards.

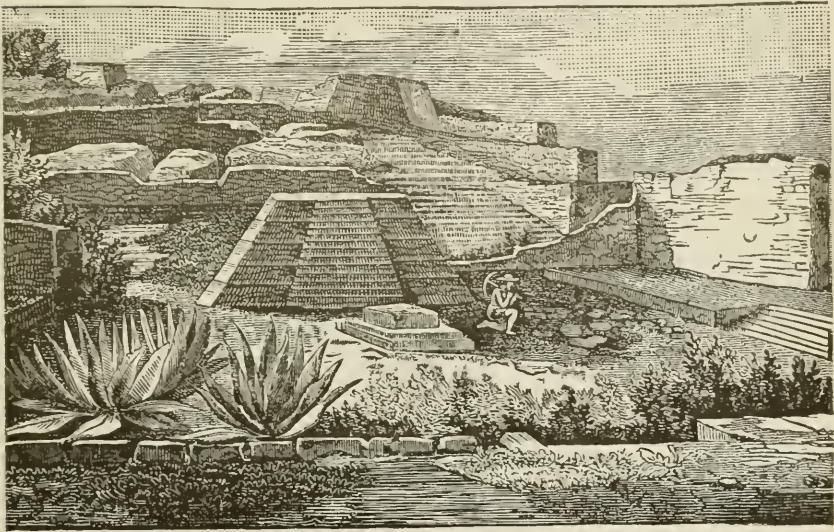
III. The feature which was the most common, was an elevation which served as a citadel, commonly called the "acropolis." The temples and palaces were placed upon these heights, and often gave them the character of "fortress cities."

Some of these citadels were with walls and some without, but the chief effort of architecture was expended upon their construction. They became the most prominent objects in the landscape and a most important feature to the cities. The majority of the cities of Central America were of this character, and were in consequence so similar in their general arrangement, that one might suppose that they were all built after the same pattern. A good example of this may be found at Xochicalco, situated about seventy-five miles from the City of Mexico, the ruins of which have been visited by many explorers. The following is the description by Mr. Bancroft :

Here is a natural elevation of conical form, with a base over 200 feet in circumference, rising to a plain of a height of nearly 400 feet. Mr.

Latrobe mentions a wall of large stones tightly wedged together, some of them eight feet wide, leading in straight lines toward the hill in each direction. A ditch, more or less filled up and overgrown with shrubbery, is said to extend entirely around the base of the hill. Near the southern entrance are two tunnels or two galleries, one of which extends a distance of eighty-two feet, with several branches running in different directions, the floor paved, walls supported by masonry, the principal gallery terminating after several hundred feet in a large apartment in which are two circular pillars cleft in the living rock to support the roof. The outer surface of the Hill of Flowers is covered from top to bottom with masonry. Five terraces paved with stone and mortar, supported by perpendicular walls, extend in oval form entirely around the circumference of the hill—one above the other. It is evident, from all accounts, that the whole surface of the hill was shaped, to some extent, artificially and was covered with stone work, and that defense was one object aimed at by the builders, that the supporting walls, projecting upward above, formed a parapet. On the summit is a platform 285 x 328 feet.

Within this parapet was a sunken area, which made the plaza, and near the center of the plaza was a pyramid, the lower story of which has a



PYRAMID OF QUEWADA.

rectangular base, which faced the cardinal points and measured 65 feet from east to west, and 58 feet north and south. The lower story is still standing to its full height; it is divided into what may be termed plinth, frieze and cornice, and is about 16 feet high.

The building itself is covered with a series of grotesque figures in the form of serpents, represented as rolling along the ground, with the head turned back and the mouth open—a form of decoration which was peculiar to this region, and which represented the mythology of the people. The whole hill, with its terrace artificially shaped and its massive structure upon the summit, reminds us of the artificial hills which are so common in the valley of the Tigris, in Syria, and other lands

of the East. These hills are known to mark the sites of ancient cities, but instead of marking the spot where a single city stood, they have been found to contain a succession of many cities and carry back the date of history many thousands of years. Similar heaps have been found in Syria; the most notable of which is the "Mound of Many Cities," which Mr. F. H. Bliss has explored and described. There were also great artificial hills in Asia Minor and in Greece, which marked the sites of the ancient cities of Troy, of Corinth, and of Mycenæ.

IV. As to the race among which the earliest cities of the Old and the New World appeared there is some uncertainty. It is supposed there was what is called a ground race,—a race which has received different names, according to the locality in which it is found—Lybian in Africa, Pelasgian in Greece, Accaddian in Babylonia, Etruscan in Rome, Dravidic in India, Mongolian in China, Maya in Central America, Quichua in Peru. This race was followed by others. The Semitics in Babylonia, Phœnicians in Syria, Crete and the islands of the sea, and by the Aryans in India and European countries.

We go back to Persia and Epirus and Italy for the earliest specimens of architecture found in Europe, but it is to the so-called ground race that we ascribe all the rude stone monuments in Europe, Africa, Syria, Persia and India, though it is unknown what race erected those found in Peru. The pyramids, on the other hand, have generally been ascribed to the Semitic race, but those in Central America to the Mayas and the Nahuas, who belong to an entirely different stock, their style of architecture being transmitted by the Toltecs to the Nahuas or Aztecs, though with many variations. The following quotation from Prof Conrad Hoeblar will be appropriate :

The race had a special knowledge of architecture. In its religious ideas it must have risen far above the animism and totemism of the wild tribes, for it would seem that religion played an extraordinary part in all the phases of life. Almost everywhere there are structures which show a high degree of taste and mechanical skill. The towns were found by the Spaniards forsaken and in ruins. In the legends of the Indians the ruins are called palaces and fortresses.

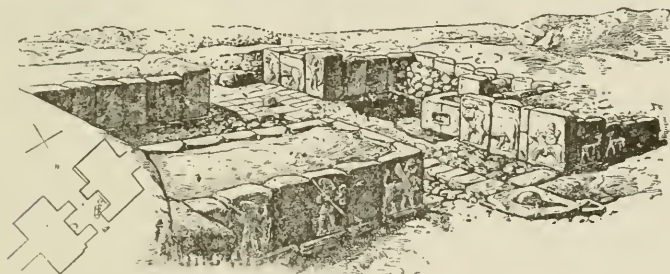
The country between Nicaragua on the south and the valley of Mexico on the north had been the home of the oldest civilization of the New World. It is not yet fully possible to give exact dates for its beginnings, but if anyone starting with a conception of the New World considers the civilization as recent in its origin, he does it great injustice. The native authors who have written the history, occasionally carry the beginnings back as far as the last century before the Christian era, and the dynasties which have been successfully identified by the hieroglyphics go back nearly to that date. The whole of Central America has undoubtedly passed through a uniform process of civilization, a civilization which seemed to be complete before the people of Nahua origin came down from the north and invaded the district.

The number of the relics of the Maya civilization which lie hidden in the forests of Nicaragua, Honduras, and Yucatan continue to increase year by year. Now and again an unexpected discovery extends the area beyond its known limits, and new styles of architecture are found, which astonish the discoverers by their elaborateness and perfection. In the district

of Chiapas, in the low forests of the Umasintla Valley, we must place not only the highest development of the Maya civilization, but also its earliest home. The southern boundary of the Maya district is as yet unknown, but it extended to the seacoast on either side, and left its ruins on the islands of the sea. On the north the characteristics of the Nahua make a sharp division, but on the south the style of the neighboring peoples is very indefinite. Within these boundaries the Maya civilization embraces an area of about 70,000 square miles.

As to the characteristics of the Maya architecture, the study of the monuments lead to the same results. The monuments of Copan, Palenque, and Chichen-Itza bear the marks of a uniform development. The fact becomes plain that it was not merely the result of a few individuals, who had arisen to the perfection of art, manifested by these works of architecture, but the entire race, for the ingenious system of writing and of arithmetical notation and chronology extends all over the land. On the high land of Guatemala, on the lowlands of the Umasintla Valley, in the far east of Cozumal, and in the far west, the works of the Maya people are seen. To-day nearly all these places lie far from the roads, hidden in the depths of the forest. The very names of the places are forgotten; separated at no great distance, but reaching from the foot of the mountain to the sea, the ruined sites of Ocotingo, of Palenque, and of Piedras Negras are now seen, each forming a large town or city; the center of a religious and political life, around which a large population clustered.

The characteristics of the architecture of the Mayas are peculiar, they are pervaded with the Mythologic creations and were devoted to religious



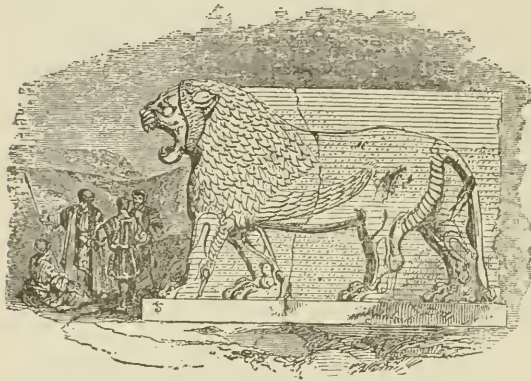
DECORATED ROOM IN PHŒNICIA.

purposes. There are no profane buildings, but a great number of religious buildings of great extent and beauty. The conclusion offers itself at once, that the social and political life of the Mayas was of the utmost importance. The priests belonged to the ruling classes and had great power, and the kings were deified, for their statues were erected in the courts and were worshipped as idols, and offerings were placed before them.

V. It was during the reign of the priest-kings in America that the mythologic style of architecture appeared. Such was the case, however, everywhere. The mythologic ornaments differed according to the locality and according to the form of mythology which prevailed, yet there were many resemblances between them, and it will be well to examine these, for they illustrate the peculiarity of architecture at this particular stage.

In the far East, where domestic animals abounded, there were winged bulls with human heads, and human figures with birds' heads and wings. In Phœnicia there were lions, bulls and human figures, but without wings. In Greece and Persia, two lions with the column standing between them. In India

the elephant was a common ornament, but it was associated with the serpent. In Egypt there were human figures with dogs' heads; heads of the ibex, of the ape, of the ox, of the crocodile, and other animals which abounded in the region. In China the dragon was the most common ornament, but it was without wings. In Corea, the tiger. In Japan, the stork.

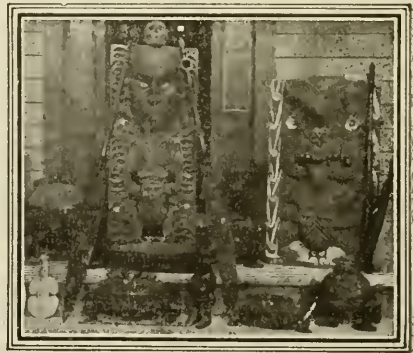


WINGED LION AT NINEVEH.

On the Northwest coast the bear and the raven were the common symbols, but these were mingled with the human figures in various attitudes. In Central America the serpent without wings was used, but generally having a human face, looking out from the

open jaws. In Peru the ornaments assumed a conventional shape, but the condor, the serpent, and the face of the sun were seen upon the façades of the temples and the gateways which led to the cemeteries.

In many countries plants were mingled with animals, but were highly conventionalized; the lotus being very common in Egypt; the honey suckle in Nineveh, and along with it the pine cone. In Central America the cornstalk, the tobacco leaf and other plants were used as ornaments, but they were associated with human figures and hieroglyphics. Human figures in grotesque attitudes were used as architectural ornaments, and were especially noticeable in the islands hrough the Pacific Ocean. These are suggestive of the mythology which prevailed. Specimens of them may be seen in the cuts.



HUMAN FIGURES IN SOLOMON ISLANDS.

At a later stage the column came into use as an architectural ornament. The first appearance of the column is in connection with the caves of Egypt. It also appeared very early in Persia, Babylonia and

Greece. The earliest form of the column in Greece, is that which appeared over the gateway at Mycenæ. It stands between two lion figures, but its position is reversed, as it tapers from the top to the bottom, rather from the bottom to the top, though it has the pediment and the capital. It was used as a support as well

as an ornament, for it rests upon a heavy lintel and supports a capstone of an arch, the three-fold element of architecture being combined in one. In America the column was used as an ornament, but it had a highly conventionalized form. There was no pediment and no capital, but instead there were bands in relief about the middle of the column. Occasionally human figures and grecques are interspersed among the columns.

The locality where the column is most numerous is in the Umasintla Valley, not far from the borders of Guatemala, in the region where the Maya tribes had their habitat. Here many palaces have been recently discovered and their forms of decoration made known by Mr. Teobert Maler. Descriptions have been published in *Globus*, accompanied by plates, two of which are reproduced and presented here. It will be seen from these plates that the columns are crowded close to-



MYTHOLOGIC COLUMN
FROM NEW ZEALAND.

gether and form the chief ornament on the entablature; one row placed between the cornice and the coping; other rows above and below. The Greek fret intervenes between the columns, giving great variety to the ornamentation. In other places the human figure is mingled with the columns. A palace is depicted in *Globus*, which has the conventionalized hook projecting from its façade. Another palace has a series of doorways whose piers are covered with hieroglyphics. Still another has a façade, with no columns but a beautiful leaf ornamentation. There is, also, here a square tower, the upper story of which has the Greek fret work, and the lower, the banded column. It may be said of all these palaces and buildings, that they exhibit a stage of architecture in which mythologic figures seem to have been gradually passing away, and conventional figures taking their place; a stage which reminds us of that which appeared in regions around the Mediterranean just before the beginnings of history. This change from the mythologic figures to the conventional forms is very interesting, for it suggests the idea that the law of evolution prevailed in architecture, as in all other things, an idea which has been elaborated by various authors.

VI. It is to this new style that we would call attention. It was a style which consisted in the use of columns as a decorative ornament, and in the banishment of many mythological figures which had preceded it. They are not perfect columns, for they lack the pediment and the capital, and yet they served the purpose, for they are very symmetrical and give an air of stateliness and refinement, which is in great contrast to the mythologic style which had prevailed. The cities in which this columnar style prevails are mainly in the Umasintla Valley, and yet they are so close to other cities, that one is led to wonder how they could have arisen. The conclusion is that they are perhaps more recent, and were possibly erected by another tribe or race.

There were, to be sure, as Mr. Charnay has shown, certain cities which abounded with square piers which resemble columns, but they were used as mechanical structures, rather than ornaments. There were also at Mitla, as Mr. Holmes has shown, piers which served as supports to the roofs and divided the doorways, and a few rounded columns, but both of these were designed as supports, rather than as ornaments. In the Umasintla Valley, on the other hand, the columns were used altogether as ornaments and there were no heavy piers. Here, the towns are scattered along the river and in the forests in great numbers, all presenting the same style of architecture; many of them, also, exhibiting altars and temples covered with hieroglyphics; some of them abounding with stelæ of even greater perfection than those found at Copan, Palenque, or any other locality. There were no such arched buildings, no such great pyramids, no such grouping of buildings, and yet the style of architecture was more advanced. The feathered snake, which was perhaps a symbol of the thunder among the Maya races, does not appear in this locality. In fact we meet with few traces of symbolism, but, on the other hand, human forms are seen in a great variety of attitudes, and the beauty of the drapery is not exceeded anywhere on the continent.

The question here arises as to the origin of these architectural ornaments. Did they arise independently of one another, or shall we ascribe them to the law of parallel development, or were they owing to the fact that they were introduced by people who were familiar with them in the Old World, and who had brought them with them in their migrations? In answer to this, we may say that the early stages of architecture were very much alike throughout the globe, but when we come to the advanced stages, we find that the differentiation becomes more pronounced and architecture arranges itself according to the styles which bear the names of the people among whom they originated, as the Ionic, Doric and Corinthian owed their names to the various tribes and nations which grew up in Greece; the Assyrian, Babylonian and Egyptian having the names of the people among whom they originated.

Architecture ranges itself among all nations under certain heads—devotional, memorial, civil, naval and domestic—but it has been found that in all countries the various structures, whatever their purpose or use, bear the stamp of the people who erected them, so that we may distinguish the works of one people from the works of another. This does not apply to the ordinary structures, such as houses, boats and bridges, for these are very similar in all countries. It is only when they reach a high degree of perfection, that they bear the stamp of the people who constructed them; and yet there were tribes in America and in the islands of the sea, who so impressed their own styles upon their handiwork, that we have no hesitation in deciding as to the people who constructed them.

VII. This furnishes another important point: there was a growth and progress of architecture in America which



SQUARE PIERS IN TULAN, MEXICO.

resembled that in the Old World in this respect: that the prevalence of mythologic creations gave place to the more conventional forms of art.

All great races have expressed themselves in distinctive ways in architecture, and may often be classified by their architectural elements.

From the ethnographic standpoint it would be profitable to give the broadest outlook, and yet view architecture retrospectively. The history of every period and every people is written in stone, for their architecture is one of the most numerous of all historic records. This, through the universal law of natural selection, has registered the progress of each nation, and has left the evidence of the inner consciousness of the people who have long since passed away. We are led to

believe that the course of true architecture has run in an unbroken stream through prehistoric times—one stage following another in regular succession—but without any radical change, and has been stayed in its onward course only by the advent of a foreign people, who have broken up all the habits of the aboriginal people and left the cities in ruins. The harmony which ever exists between the intellectual and social condition of man and his outward works was suspended and overthrown in that great convulsion, and architecture, as well as civilization, was left in a most shadowy condition.

Still, as we look upon the ruined cities scattered over the different parts of our own land, we are led to say that originality has never been more thoroughly displayed than in these sections of the New World. The component parts of each style may, indeed, have been borrowed from a previous condition and must be considered the products of an age which has passed away. But when it is once realized that a certain phase of architecture is the outcome of a certain phase of historic and geographic conditions, there will be no hesitation in considering it as a reliable indigenous record of the past.

There are many illustrations given to us by the structures of the New as well as of the Old World of the fact that the elementary principles are the same on all continents and among all people, but the differentiation takes place in the more advanced stages; the lowest stages showing to us the effect of the purpose to which a structure is devoted; but the highest stage showing the effect of the tastes and ideas of the people. The architecture of the Old World has been diligently studied, and all its peculiarities have been fully described. The lesson to be derived from it is that there was a double process in every land, viz.: a development from the lowest stages to the highest by the unaided energies of the same people, and the borrowing of ornaments and styles from other nations and incorporating them with those which had been adopted.

Every archæologist knows that the figures found over the gate at Mycenæ are very similar to those found on the tombs in Persia. The winged circle and sphinxes found in Assyria are similar to those found in Egypt. The winged bulls found in Phœnicia are similar to those found in Babylonia, and there is no hesitation in saying that they were transmitted. It is also well known that the stupas and pagodas and towers of China closely resembled those found in India, and there is no hesitation in ascribing them to Buddhism.

There are in America many ornaments which so resemble those found in the Old World, that it is difficult to account for them, unless we acknowledge that they were transmitted by some unknown source at some unknown time, and adopted by the people of this continent. Among these we may mention the serpent figures which are so common upon the façades of the palaces and temples of Central America and the stair-

ways which lead to the temples. These are supposed to symbolize the great nature powers, and by some are ascribed to a separate origin; but it is known that serpent worship prevailed throughout both continents, and was the earliest form of religion everywhere. The temples in China are surmounted by great dragon figures, carved with much skill. These have been ascribed to the contact with India, and traced back to a very early date. Similar figures have been found in Cashmere, and are supposed to have been introduced by the Buddhist priests.

It is supposed that architecture is the product of innate taste and always appealed to the sense of innate beauty, but as we go



COLLONADE AT BAALBEK.

back to its early stages and examine the ornaments and symbols embodied in it, we find that mythology had more effect than any other element, and what is very strange, the mythology is very similar in all countries. As proof of this, we need only to refer to the fact that the altars, temples, and even the palaces in America were covered with similar hideous objects, resembling those of China and India and Babylonia; and at times it seems as though these very symbols and ornaments had been transmitted from land to land, and finally reached this continent.

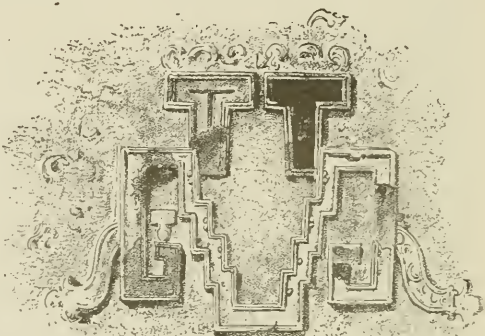
The symbols which are the most common, are those of the serpent and the tree, and these seem to have been recognized by such archæologists as Sir Arthur Evans in the ruins of Knossos and in Crete, conveying the idea that they were carried to that region by the Phœnicians, or some other race.

The lion and the tree has also been recognized in the rock-cut tombs of Persia, as well as at Mycenæ and Tiryns. The serpent symbols are very prominent in Cambodia, and serves the same purpose—that of a guard protecting the entrance to the temple.



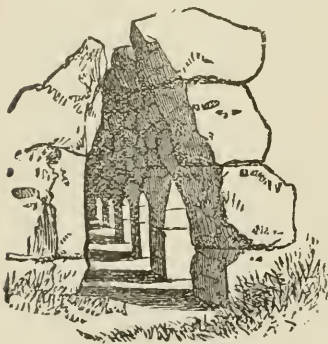
FRIEZE ORNAMENT AT PALENQUE.

open jaws; the scales on their bodies and the curved form and uplifted head making them very impressive objects, and calculated to excite fear among all who approach them. The roll of the serpent and the position of the head are exceedingly life-like. There are also figures of serpents over the doorways of the Thlinket on the Northwest coast, which so closely resemble those seen on the coats of arms in the island of Borneo, that one is led to believe the symbol was transmitted from Asia to America.



TAU ORNAMENT AT PALENQUE.

There are, also, carved columns or stelæ at Copan in Central America, on which may be seen serpent figures running up their whole length, held in the hands of dwarfs, whose faces and forms stand out in bold relief; the heads of the serpents being very conspicuous at the top of the column. The serpent is a common symbol in India, and Buddha is often represented as resting upon the back of a serpent, with many Naga heads forming a hood.



ARCH AT TIRYNS.

The question as to the dates is important in this connection. It has been ascertained by recent discoveries in the Mediterranean, as well as in the Tigris, that there were many palaces and temples, walled cities, and labyrinths.

which were erected long before the days of Homer. These discoveries carry us back thousands of years, before we really find the beginnings, either of history or of art, or of architecture. What is more, they prove to us that there were migrations which extended through long distances, and reached not only the waters of the Mediterranean but the coasts of India, and possibly extended to the west coast of North America.

VIII. This is the lesson, which we learn from comparing the architecture of the Old World with that of the New World. There was probably a transmission of types and patterns, symbols and ornaments, which formed the basis of the architectural ornaments of the New World.

The continent may, indeed, have been settled by rude tribes, which made their way gradually from north to south, leaving



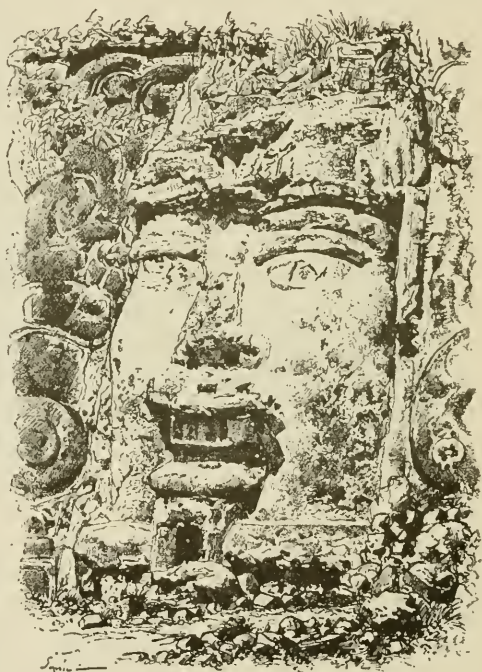
RUINED ARCH AT CAMALCALCO.

tokens of their progress at various points. But as they reached the beautiful valley Mexico and the rich plains of Central America, they began to erect those structures which best served their convenience; making the pyramids above the surface of the ground, and placing upon the summits the houses of the rulers and surrounding them with all the magnificence which belonged to the despots of the East; but leaving the common people to occupy the huts similar to those which are found at the present date.

Examples of these points will be found in the various cuts; one of which illustrates a serpent or dragon figure which was sculptured upon the walls at Xochicalo or the "Hill of Flowers"; another represents the mythologic figure carved upon the wooden posts in New Zealand; another, the square piers and upright walls, which Charnay discovered at

Tulan in Mexico; another represents the columnar style which prevailed in the Umasintla Valley; still another, the columns which are still standing in the ruins of Baalbek. Other cuts represent the peculiar ornamentation which was common in Central America; an ornamentation which is founded upon mythology, but which had become so conventional that the original design can hardly be recognized. It, however, when studied, resolves itself into a manitou face. The hook representing the face, the peculiar vase-like ornament representing the eyes, the two curves representing the eyebrows, the square bosses representing the ears, rosettes above representing the forehead. This same conventional figure, with variation, may be seen on the sculptured front at Kabah.

There are also ornaments at Kabah and Labnah, and many other localities, some of which have features which are evidently designed to represent the faces of aborigines, but others have features which closely represent those of a white man. These various sculptured ornaments bring considerable confusion into the account, for while there is no hesitation in ascribing some of them to a native origin, others so resemble ornaments and symbols which are common in the Old World, that one is tempted to ascribe their presence to a transmission by some unknown means and at an unknown date. Among these latter are the Egyptian tau, the Greek fret, the scroll, the medallion, the lattice work, the crosses of various kinds, and the serpent figure. These are, to be sure, so blended with mythologic figures, that it is at times quite difficult to separate them, and yet there is a marked distinction between the two classes of ornaments.



COLOSSAL HEAD AT IZAMAL.

Mr. Stephens speaks of the human face issuing from serpents' jaws and the hooked symbol extending beyond the

corner. The frieze which surrounds it presents a series of small human figures, seated in the Eastern manner, with the right hand crossed on the breast and with massive plumes upon the head. Over the frieze was a cornice, decorated with very delicate designs in the form of meanders in the Greek style.

The city of Mitla furnishes the best illustration of the point which we have in view. This city was situated on the southern border of Mexico, in Oaxaca, and presents ruined structures which are better preserved than most others in Mexico. They are not so extensive as the remains of Monte Alban or Teotihuacan, nor do they represent a city comparable in size with those which existed in Yucatan and Guatemala. They are, however, very interesting, and bear out the impression that the pre-Columbian people had developed architecture in certain lines, especially temple architecture, far beyond the stage commonly ascribed to savage races. The ruins were visited by Spanish and later explorers,* and descriptions were furnished by them. They have also been visited by many persons during the last century, who have furnished sketches and drawings of them. Descriptions have been furnished by Humboldt, Brasseur de Bourbourg, Kingsborough, Viollet le Duc, Delafield, Baldwin, Bradford, Prescott, Brantz, Mayer, Bandelier, Holmes, and Bancroft.

The ruins embrace several groups which are situated in a valley and a fortress situated on a height of ground, about five miles distant, and a remarkable cruciform tomb on the mountain. There are no high pyramids here, but a large number of low platforms, on which are ruined structures, which extend in a line from north to south 2,000 feet, and from east to west 1,000 feet; all of them finished with the highest type of native sculpture, but with no animal or human figures upon them. Otherwise they resemble the ancient buildings of the Toltecs, and may well be compared to the ancient buildings which still stand in Central America, at Palenque, Uxmal, and Chichen-Itza, and those at Cuzco in Peru, which was the dwelling place of the Inca. It may be said of all the buildings, with their columns and walls, that they were more substantial and perhaps better finished, and show a higher style of art and architecture than any which prevailed in the City of Mexico at the time it was conquered by Cortez and his troops.

We infer this, not only from their present condition, after the lapse of three or four hundred years, but from the fact that they were constructed of stone in a very substantial manner; while the supposition is that the buildings in the City of Mexico were constructed of wood, a supposition which is confirmed by the writer quoted below.

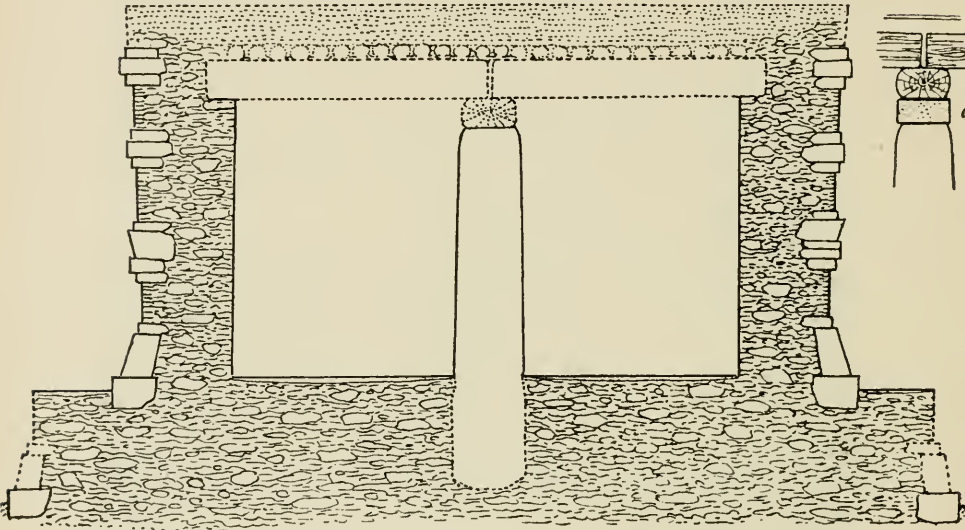
Bancroft calls them the finest and most celebrated group of ruins in Oaxaca, and the finest in the whole Nahua territory.

*Don Luis Martin, 1802; Dupaix and Castaneda, 1806; Brantz Mayer, 1837; Muhdenpfordt, 1830; M. de Fossey, 1838; Sr. Carriedo, 1852; Von Tempsky, 1854; Garcia, 1855; Charnay, 1859; Holmes, 1897, and M. H. Saville, 1900.

He says that here was a great religious center, often mentioned in the traditional annals of Zapotec.

The description which we give below has been made up of quotations from Mr. Holmes' Report, which, with the plates, will show the elaborate character of the ornamentation and the main features of their construction. Other writers have spoken of the decorations of the walls and the object for which the buildings were erected. A few words will, however, be appropriate on the resemblances and contrasts between these buildings and those situated in the regions both to the north and to the south.

First, in reference to the columns: in Yucatan, round columns were used, partly for ornament and partly for support,



TRANSVERSE SECTION OF BUILDING OF DOUBLE BEAM SPAN.*

[Courtesy of the Field Columbian Museum.]

and were visible in the façade. In Mitla their use was confined to the interior, where they were employed to support the horizontal roof timbers of the wider chambers. There are but three or four rooms so wide as to make such supports necessary, in these they are arranged along the center, and doubtless supported longitudinal ceiling timbers, though the Spanish writer F. de Burgoa quoted by Mr. Ayme, holds, that the ceilings were made of slabs of stone.

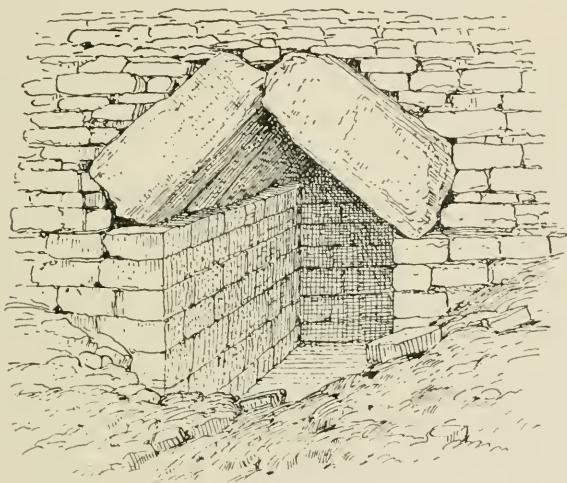
Second, There were no arches in Mitla such as were common among the ancient structures of the Mayas, but the buildings were all rectangular, with straight ceilings and per-

* By this device three of the halls at Mitla were given a width from twenty to twenty-three feet. The distance between the columns was about equal to that between the columns and the walls.

pendicular walls, which were highly-embellished. There is an arch at Monte Alban which covers an ancient gallery, or tomb-like chamber. "The chamber is about twelve feet in length, the lateral and end walls faced with squarish blocks of slightly-hewn stone, resting on the lateral walls and leaning together at the top, in this respect resembling the arch within the pyramid at Gizeh." This is the nearest approach to an arch that has yet been found in Mexico, or even in Central America. There is no such arch at Mitla, and the only supports are in the columns.

Third, There were no corridors, as at Palenque and Uxmal, though there were porticos, which receded from the front of the buildings and were supported by pillars or square piers, which were panelled or sometimes decorated with grecques.

Fourth, The cornices were totally unlike those common in Yucatan, and were mere copings, without any projections, with



ARCH AT MONTE ALBAN.

no other entablatures than the grecque panelling below the coping.

Fifth, The ruins of Mitla resemble Palenque, in the long, low, narrow form of the buildings. They also resemble the structures of Yucatan in that they are long, narrow, windowless buildings, raised on low mounds, and enclosing a rectangular courtyard.

Sixth, There are no such terraces at Mitla, as there are at Monte Alban.* At Quiotepec a hill is made into level platforms, with terrace walls of stone; also remains of dwellings, between which was a line of circular pillars. Brantz Mayer says that this hill is over a thousand feet high

* The panorama on page 397 shows the terraces at Monte Alban.

and a mile long, and there are thirty-five terraces on the western slope, fifty-seven on the southern, and eighty-eight on the northern. One of the walls at the summit is 320 feet long, sixty feet high, and five and one-half feet thick. At different points, towards the summit of the hill, are three tanks, one of which is sixty feet long, twenty-four feet wide, and six feet deep, with steps leading down to it. Stately edifices, supposed to be palaces and temples, face each other, 166 feet apart. The palace is thirty-nine feet high, and has a stairway of twenty steps, about twenty-eight feet wide, leading up to the summit.

Seventh, There are no "seats," such as have been described as existing at Quemada, at Xochicalco, at Cuzco in Peru, and other places. These so-called "seats" at Quemada are said to face the court in which there is an altar, and has been called the assembly place, or place of sacrifice. Seats are cut out of the solid rock on the summit of a mountain at Tescocingo, the site of an Aztec palace which overlooked the plain below.

As to the object of the buildings there is a great uncertainty: some hold that they were designed for the residences of priest-kings, who made this a great religious center; others hold that they resemble palaces, more than they do temples;* while others hold that they were places for the burial of the dead, and the subterranean chambers were used for the depositing of vases or urns containing the remains of the dead. Bancroft calls the ruined edifices, palaces, but describes them as if they were temples. He says:

Here was a great religious center, often mentioned in the traditional annals of the Zapotecs. The original name seems to have been Liobaa, or Yobaa, "the place of tombs," called by the Aztecs Miquitlan, Mictlan, Mitla, "place of sadness," "dwelling of the dead."

The gloomy aspect of the locality accords well with the dread signification of its name. The ruins stand in the most desolate portion of central Oajaca, in a high, narrow valley, surrounded by bare and barren hills. A stream, with parched and shadeless banks flows through the valley, becoming a torrent in the rainy season, when the adjoining country is often flooded. No birds sing or flowers bloom over the remains of the Zapotec heroes, but venomous spiders and scorpions are abundant.†

The following description of Mitla is by Francisco de Burgoa, who wrote in 1545, and took the same view as other Spanish writers of the time, that everything in Mexico of an advanced character was from the devil, and was, therefore, to be condemned and destroyed, if possible. His description is valuable, as it gives a hint as to the use or object of the buildings when they were occupied. He thinks it was a place ruled and occupied by the priests, to whom even the kings were subject; but it was kept as a burial place for the chiefs of the

* From all the descriptions which have been given we know that the temples of Yucatan were erected on summits of pyramids, and were approached by high stairways, some of which were furnished with massive stone balustrades in the shape of serpents, whose heads project beyond the pyramid, as if designed to protect the temple from the approach of profane feet. There is, however, no such temple at Mitla.

† Bancroft's "Native Races," Vol. IV., page 389.

Zapotecas, though it resembles the inferno, from the depths which were there. He says:

They built in this place this beautiful house or Pantheon, with stories and subterraneans, the latter in the concavity which was found under the earth, equalling in style the halls which enclose it, having a spacious court; and to build the four equal halls they worked with what force and industry they could secure from a barbarous people.

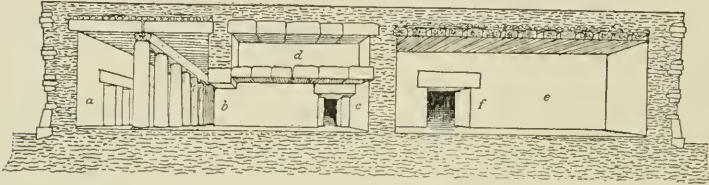
It is not known from what quarry they could cut such great pillars of stone, that with difficulty two men could embrace them with their arms extended. These, although without capital or pedestal, straight and smooth, are more than five yards long, composed each of a single stone, and served to sustain the roof. The roof was of flat stones two yards or more long, and one broad, and half a yard thick, laid upon the pillars successively. The flat stones are so much alike and so well adjusted one to the other, that without mortar or cement they appear in their construction like tables brought together. The four halls are very spacious, covered in the same way with this kind of roof. The walls excelled in execution the work of the most skilled artificers of the world, so that neither the Egyptians nor the Greeks have written of this kind of architecture, because they began at the lowest foundations and followed upwards, spreading out into the form of a crown, which projects from the roof in breadth and appears likely to fall.

The centre of the walls is of a cement so strong that we do not know with what liquid it was made. The surface is of such a singular construction that it shows something like a yard of stones. The sculptured blocks serve to hold innumerable little white stones that fill it, beginning with the sixth part of an ell and the half of an ell wide and the quarter part of an ell thick, so smooth and similar that it seems as if they were made in a mold. Of these there was so great a variety, and they were so connected one with the other, that various showy pictures an ell wide each, the length of the hall, were constructed with a variety of decoration on each as high as the capital. And it was so neat that it exceeded the description, and what has caused astonishment to great architects was the adjustment of these little stones without mortar or any instruments. They worked them with hard flints and sand, and produced a building of so much strength that, being very old and beyond the memory of the living, it has lasted to our times. I saw it much at my ease thirty years ago. The rooms above were of the same style and size with those below, and although portions were somewhat ruined because some of the stones had been carried away, they were very worthy of consideration. The door frames were very capacious, composed of a single stone of the thickness of the wall at each side. The lintel or architrave was a single stone which held the two below.

There were four halls above and four below. They were divided in this way: That in front, served as a chapel and sanctuary for the idols, which were placed in a large stone that served as an altar at the great feasts or at the funeral of some king and principal chief. The Superior gave notice to the lesser priests or inferior officers that they should arrange the vestments and decorate the chapel, and prepare the incense. They went down with a great escort without any of the people seeing them, nor was it ever permitted them to turn their faces toward the procession, being persuaded that they would fall dead in the act of disobedience. Upon entering the chapel the priest put on a large white cotton robe, and another one embroidered with figures of beasts and birds in the manner of a surplice or chasuble. Upon his head he had something after the style of a mitre, and upon the feet another invention woven with threads of different colors, and thus clothed he came with great pomp and circumstance to the altar. Making great obeisance to the idols he renewed the incense, and began to talk very much between his teeth with these figures, the depositories of infernal spirits. In this kind of communication he continued with these deformed and horrid objects, that held all overcome with terror and amazement until he recovered from his diabolical trance, and told the spectators all the fictions and orders which the spirit had persuaded him of, or which he had invented.

When he was obliged to make human sacrifices, the ceremonies were doubled, and the assistants bent the victim across a great stone, and opening the breast with some knives of flint they tore it apart with horrible contortions of the body, and laying bare the heart they tore it out with the soul for the Demon. They carried the heart to the Chief Priest that he might offer it to the idols, putting it to their mouths with other ceremonies,

One hall was the burial place of these priests, and another hall was for the kings of Theozapotlan, who brought decorations of the best garments, feathers, jewels, and chains of gold with precious stones, arming them with a shield in the left hand and in the right a sword, like those they used in their wars. During the funeral rites they played upon very sad and dolorous instruments, and with grievous lamentations and great sobbing they went on chanting the life and exploits of their chief, until they placed him upon the funeral pile intended for him. The last hall had another door at the rear into an obscure and fearful opening that was closed with a great stone, to shut the entire entrance, and into it they threw the bodies of those that they had sacrificed, and also those of great chiefs or captains that had been killed in battle, from whence they brought them, although from a great distance, for the purpose of burying them there. Here was practised the blind barbarity of the Indians. The wicked priests taught those who were suffering from infirmities, or from their labors, that here they might hope for a happy life; and they let them in alive, among those sacrificed. They then withdrew the attendants, and departing by the



SECTION OF THE HALL OF COLUMNS, AND APARTMENTS IN THE REAR.

[Courtesy of the Field Columbian Museum.]

- A. Hall of Six Columns. B, C. Passageway from Hall of Columns to Grecque Courts.
C. Entrance to Grecque Court. D. Supposed passageway; ceiling construction theoretic.
E. East grecque chamber with doorway into Grecque Court.

opening, they again replaced the stone. The miserable creatures then, wandering about in that dark abyss, perished of hunger and thirst.

* * * * *

The high rooms remained open which surrounded the square and other halls which were below, and the remains exist to the present time. One high hall was the palace of the Chief Priest, in which he gave audience and slept, which occupied the whole square. The throne was of the height of a cushion, with arms covered with tiger skins and stuffed with soft feathers or very pliable grass adapted to that use. The other seats were smaller.

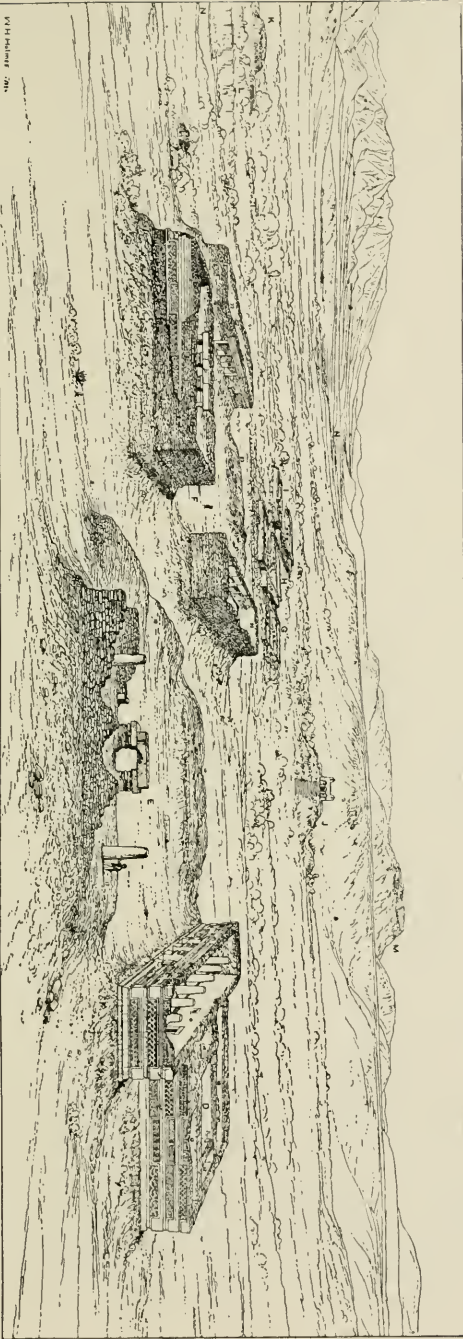
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The second hall was that of the priests and their assistants. The third that of the King when he came, and the fourth that of the other leaders and captains. The space being limited for so many different and various households, they conformed themselves to circumstances, without preferences or partiality; no one having any jurisdiction, there except the Chief Priest, whose authority was supreme over all.

All the halls were well covered with mats and very clean. No one, not even of the highest officers, was permitted to sleep in the upper rooms. All used very curious mats upon the ground, with the soft skins of animals and delicate fabrics to cover themselves. Their food was ordinarily animals from the mountains—deer, rabbits, and other sorts,—together with birds, which they obtained in the lakes or artificial ponds. Their bread was from white corn meal well crushed.

This description is very interesting, for it furnishes an explanation of the object of the buildings, especially the underground chambers.

The buildings here are so much alike, that it is difficult to tell which was used for a temple and which for a palace or even to decide whether the place was used for residence or worship or the preservation of the dead. There are, however, certain features which are common throughout the entire province of Mexico and, with some variations, are also common in Central America. Among these are subterranean chambers or galleries, which are common elsewhere, but the galleries which constitute the basement story of one of the buildings is larger and better finished than any other thus far discovered. It is difficult to



PANORAMA OF MITLA.

D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z—Group of the Columns. D, Hall of the Columns; 12, 13, 14, and 15—apartments on the four sides of Hall; 16—Hall of the Columns. E, Court of the Quadrangle of the Columns; 17, 18 and 19—ruined structures on three sides of the Court. F, Court of Basement Galleries; 20, 21 and 23—structures around the Court. 22—Hall of the Basement Galleries. G, H, I, Arroyo Group. J, Adobe Group and Catholic Church. K, L, South Side Group. M, Fortified Hill.

decide what the purpose of this basement story was, whether for protection from the heat, or a gathering place for the priests, or a training school for the initiates, or a place for observance of sacred ceremonies.

It will be seen from the panorama that the buildings were all arranged in quadrangles, the same as they were at Teotihuacan, at Monte Alban, and in the City of Mexico, but with this difference: the walls are still standing, though some of them are in ruins, while at the locations mentioned they have disappeared, and nothing is left but the platforms on which they stood.

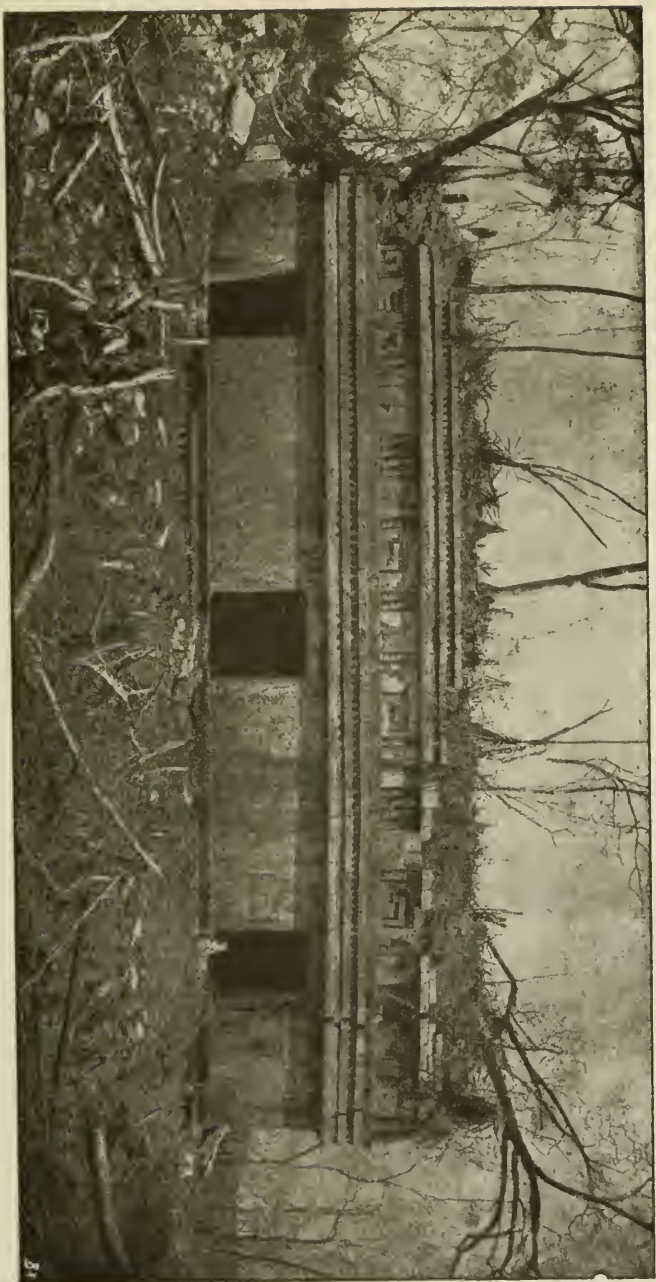
This quadrangular arrangement of buildings around an open court may be seen at Palenque, Uxmal, and Chichen-Itza, showing that the general plan of the Toltec cities were the same as those of the Mayas. There is, however, this difference in all of these cities: there is a lofty pyramid near each one of the quadrangles, and on the pyramid an isolated temple, or shrine, and one or more stairways leading to it. This can be seen by studying the panorama, furnished by Mr. W. H. Holmes, and descriptions by Mr. J. L. Stephens and others.

There is a general resemblance between the buildings in all the cities, both of Mexico and Central America, as the most of them are rectangular and are all arranged with the doors facing in towards the court. In the southern cities there were arched portals, which gave the palace an air of stateliness, and sometimes lofty combs on the summit of the building, and occasionally there were towers, three or four stories high, near the palaces, which gave them apparent height, so as to correspond with the temples.

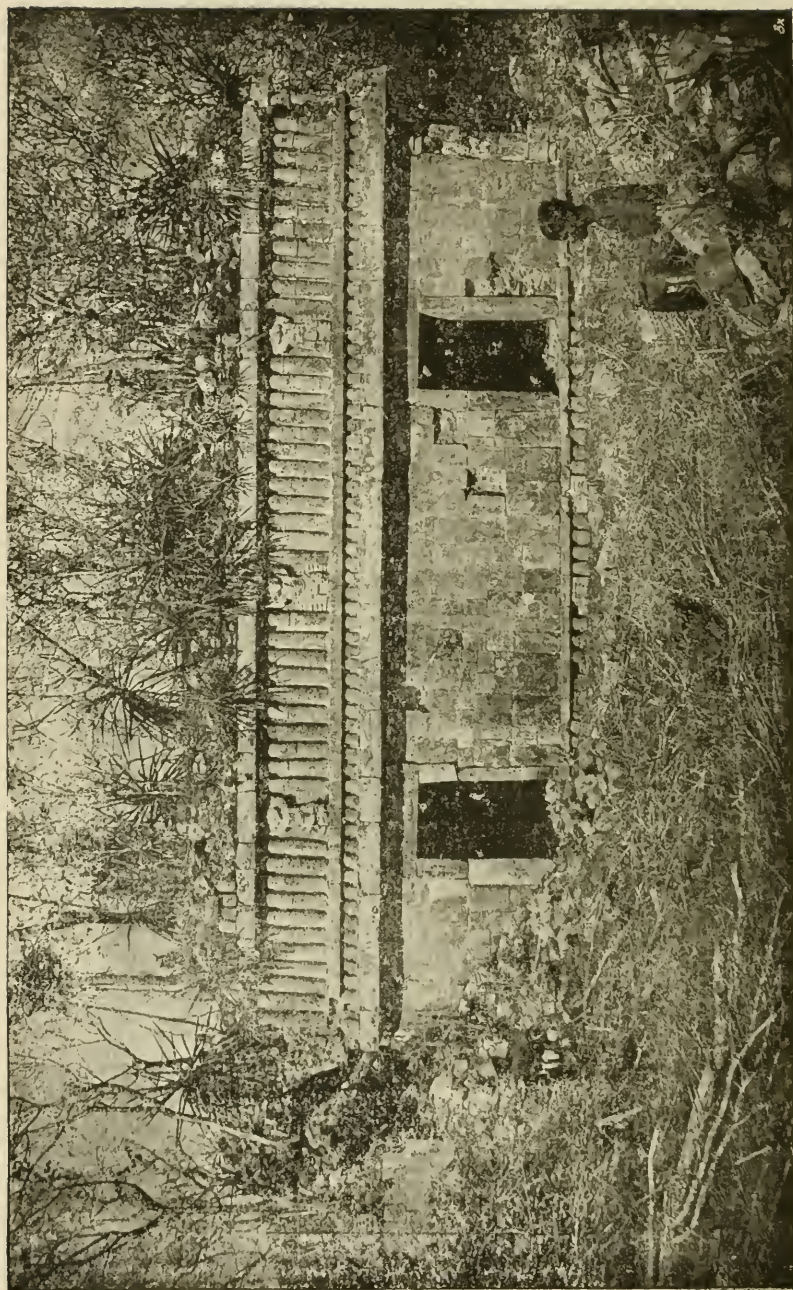
From the description given by the Spanish historians, we learn that the palaces of Montezuma were arranged in the same way, and that the Teocalli adjoined the palace and was built in the form of a terraced pyramid, with a tower on the top of it. It was surrounded by shrines, temples, and altars and places of sacrifice, all of them inside of a walled enclosure.

The most interesting of all the ruined buildings are those which are situated in a central position, and are arranged in quadrangles, but gathered into one group, which is called "The Group of the Columns."

The walls of the buildings are generally between three and four feet thick, and are rarely much more than twelve feet in height, and there is nowhere any sign of a second story. The interior body of the wall is built of rough stone, laid with considerable regularity in coarse adobe mortar. The surfaces were faced with blocks of cut stone, or were finished in plaster. The exterior walls and those facing the courts were handsomely finished with panels of fret-work in relief. The doors are all large, and the jambs, lintels, and pillar caps are usually of cut stones of large size.



PALACE WITH COLUMNS IN THE UMASINTLA VALLEY.



PALACE AT PIEDRAS NEGRAS, WITH COLUMNS AND CORNICE OVER DOORWAYS.

CHAPTER XIX.

PALACES AND TEMPLES IN CENTRAL AMERICA

The study of the native architecture of the New World has brought us at last into the midst of the ancient cities of Central America. These are proving to be far more numerous than has been supposed, but in treating of them we shall take only those which are the most prominent.

These ruined cities are all characterized by the same features. There is to be seen in each a large quadrangular building which is supposed to be the palace. Near it are generally several temples or shrines situated on lofty pyramids with stairways leading to them. In some of them there is a circular or conical building called the castle or caracol which is centrally located, and may have served as a shrine or temple. It has spiral stairways, winding around a central core or column, and is somewhat conspicuous. In most of the cities there is a large building which is supposed to have been used as a religious house, and is called the Nunnery. In some of the cities is what is called the Gymnasium or Tennis Court, suggesting the idea that the people who dwelt in the city were given to amusement, and lived in luxury. There are Courts and Plazas in each of the cities which were probably paved; some of them were surrounded by corridors, and were adorned with many statues, and altars in front of the statues.

The cities were situated near a stream or a great well, and depended upon these for their supply of water.

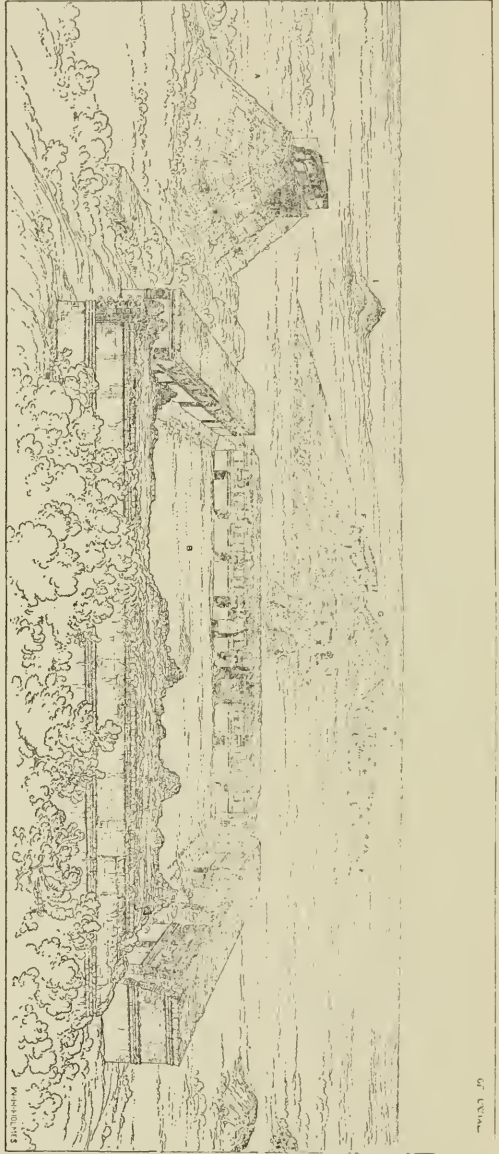
Such are the general features; but there are variations in the style of decoration and in the religious symbols, which show that each city was ruled over by a different king, and a different class of priests, and had its own peculiar style of ornament and religious symbols. The palaces and temples are always the most prominent in every city, and are noticeable because of the peculiar decorations and carvings which are seen upon their facades; and because of the many portrait columns which are near them.

The locality where the greatest number of ruined cities is to be found is in the Peninsula of Yucatan. Here are the well known cities of Uxmal, Chichen-Itza, Kabah, Izamal, Merida, and further to the west, Palenque and Lorillard, a city

which has been described by Charnay, and further to the southwest in Guatemala, the famous city of Copan. The physical geography of this region is very different from that of Mexico.

There are no rivers, and the few small streams along the coast extend but a few miles inland. The Maya race which occupied this region, was a quiet, peaceful though brave people, living simply on the products of the forests, each community taking but little interest in the affairs of the world away from their own immediate neighborhood. Yucatan presents a rich field for antiquarian exploration, and furnishes finer and more numerous specimens of ancient aboriginal architecture and sculpture than have been discovered in any other part of America. The state is literally dotted with the ruins of edifices. Fifty or sixty different localities have been visited by different explorers, and described as full of ruins that have a remarkable resemblance to one another. Among the explorers may be

PALACES AND TEMPLES AT UXMAL.



mentioned Waldeck, Stuepens and Catherwood, Norman, Charnay, Maudsley, and more recently Seler, Maler, Thompson, W. H. Holmes, and the parties sent out by the Peabody Museum.

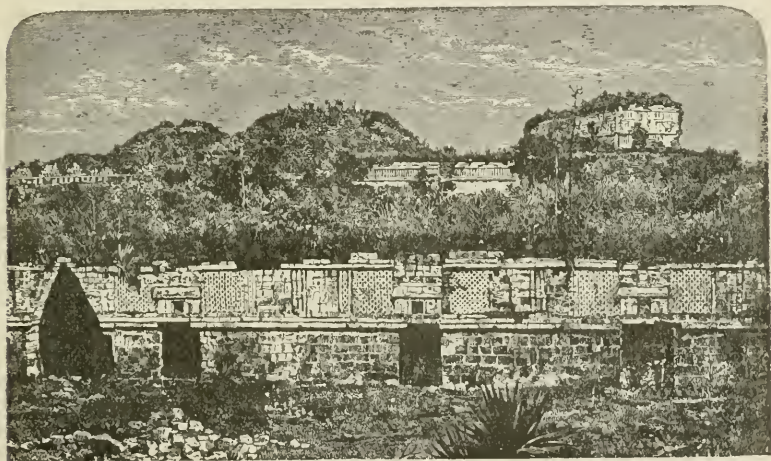
and the Museum of Natural History, New York.

For convenience, the ruins can be divided into four groups, the northern group, including Ake, Izamal, Merida, Mayapan; the central group, including Uxmal, Kabah, Labna, and nineteen other localities; the eastern group, the ruins of Chichen-Itza; the western group found in Guatemala and Honduras, including Copan, which is one of the most famous of American ruins.

1. We begin with Uxmal, a city which presents a great variety of structures, some of which were designed for palaces, others for religious houses. All of them represent the architectural style of the Mayas; some of which have been already described.

Mr. Holmes says:

"There were five great structures that take rank as specimens of Maya architecture. These are, the Temple of the Magician, (A) the Quadrangle, (B) called the Nunnery, the House of the Turtle, (C) the House of the Pigeons, (F) and the Governor's Palace (E). Certain features of material, construction, plan, and ornament are common to all. The stone used is the pale yellowish, and reddish gray lime stone of the locality, and was set in mortar



PALACE AND TEMPLES AT UXMAL.

the walls were thick, averaging perhaps three feet, and divided nearly midway by mouldings of a prevailing type, into an upper and lower zone, the entablature decorated with composite sculptures, shoe-shaped coping stones, and level roof. There are no windows. The doorways are confined to the lower or plain zone of the wall; they occur singly, the great portals with columns, not being seen at Uxmal. The jams are faced with cut stones like that of the walls, the lintels are of zepote wood. The plan of the buildings usually takes the form of a long narrow rectangle with two ranges of rooms, four such buildings surrounding a court, thus forming a quadrangle. None of the buildings are over one story in height; nearly all are built on terraces; the apartments are all of good size and height, and the vaulted ceilings are formed of the usual wedge-shaped arch constructed of horizontally placed stones, beveled with a slope. Stairways were numer-

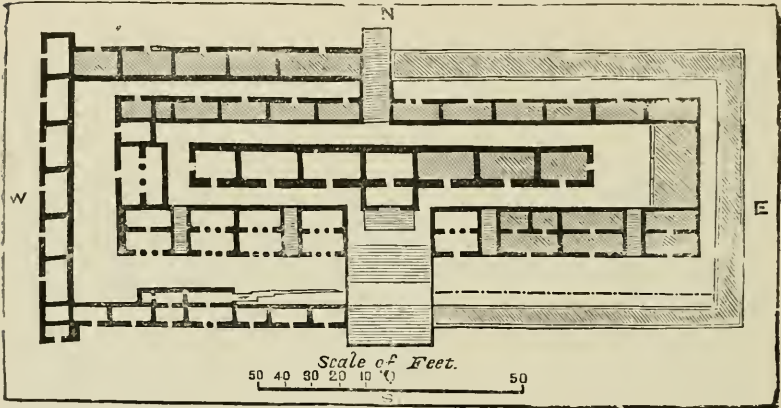
•The cut is taken from Charnay's book *Ancient Cities of the New World*.

cus, wide, and of stone, and were usually quite steep. A common feature of the court was a standing stone or picket.

The Temple of the Magicians is the most notable in the group, and is first to catch the eye of the visitor. The steep pyramid supports upon its summit, a ruined building, and upon the western face near the top, is a second structure of remarkable position and appearance. The height of the pyramid is upward of 80 feet, the length is 240 feet, and the width 160 feet. The temple that crowns the summit is some 70 feet long, and 12 feet wide, and contains three rooms. The most striking feature is the temple built against the north side of the pyramid, having its roof on a level with the crest of the pyramid. The facade of this temple is the most ornate and composite piece of sculpture. The space above the doorway is occupied by a colossal face or mask, some twelve feet square, worked out in a wonderful manner. The corner decorations comprise smaller masks, seven in each tier. The exterior wall surfaces of this temple are entirely covered with these ornaments. The pilasters are placed at the sides of the doorway, and the lintels consist of three strong beams.

The Nunnery Quadrangle is one of the best known specimens of Maya architecture. Four great rectangular structures, low heavy and formal, stand upon a broad terrace in a quadrangle, their ornate fronts facing inward.

Examining the various motives, we find the great snouted mask was



PLAN OF TEMPLE.

the favorite, and is found in all the fronts. Next to the mask design is the serpent which appears in the east, west, and north fronts. The colossal feathered serpent on the west, enclosing panels and intertwined facade is a most effective piece of work, and must be regarded as a masterpiece of decorative sculpture. In the front of the eastern building are four ornaments, consisting of five parallel bars of double headed serpents, and near the top a colossal human head. In the north front, the same conventional serpent occurs in pairs, and in varied forms. The life size, or colossal human figures in the round, form a fourth group of motives. They were centerpieces in decorative fields. The apron shield placed at intervals along the frieze forms a fifth class of decorative elements. Human figures in high relief and phallic symbols occur on the exterior walls of the north building."

The Gymnasium or Tennis Court, is another structure which is found here and at Chichen-Itza, built upon the general level of the site. It is composed of two massive walls or oblong piles of masonry ninety feet long, twenty feet high, and twenty feet thick, according to Stephen's measurements. Mr. Holmes thinks they were so thick because they were designed as audience places.

The Governor's Palace is near the Ball Court. Mr. Holme's says:

"This superb building is justly regarded as the most important single structure of its class in Yucatan. It is extremely simple in plan and outline and measures 320 feet long, 40 feet wide, and 25 feet high. It is divided into three parts, a long middle section, and two short ones, by transverse archways. The front wall is pierced by nine principal doorways, the west wall is unbroken save by two archways and presents a facade of rare beauty. The wall is nine feet thick nearly the whole length, and increases to twelve or thirteen feet at the level of the capstones of the interior arches. The rooms rarely exceed ten or twelve feet in width, but they are all arched. The length reaches sixty feet in two cases. The included belt of sculptures is about ten feet wide, and extends entirely around the building. It is therefore, 720 feet long, and includes in its ornamentation 20,000 stones, all of which are sculptured and individual in shape.

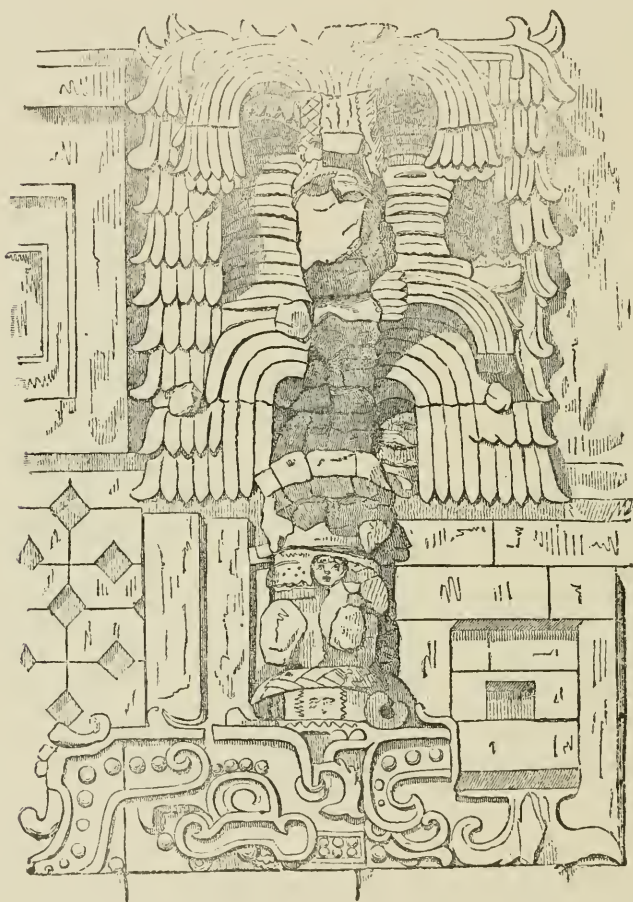


ANIMAL HEADED THRONE.

There are several motives, viz., the mask the fret and the lattice, horizontal bars terminating in serpent heads, the elaborate masks showing curved snouts, deep eyes, square ear ornaments, serpent brow band, stella ornament. The arches in this building are the most remarkable in the country. As seen from the west this building is truly a wonderful creation, and set high above the plane upon its stable terraces, it must have been a residence worthy of any barbarian ruler or potentate. The most novel and striking features of the building are the two high pointed archways, which from their deep recesses extend from roof to floor. These arches are the most remarkable in the country; each is 25 feet long, 10 feet wide and 20 feet high. The spring of the side walls begins near the floor and extends to the steep sidewalls above."

The façades at Uxmal present a number of human figures some of which were finished in the round, one of them in a sitting posture, with the head crowned with a mass of plumes which were larger even than the body itself. This is represented in the cut, though the human figure has been destroyed.

It is to be noticed here, that all of the cities of Central America, including Uxmal, Chichen, and Palenque, present



SEATED FIGURE WITH PLUMED HEAD DRESS.

a style which was evidently borrowed from their mythology, as the serpent figure and Manitou Face are common. Still there were on many of the palaces plumed figures and statues which represented royal personages, while in the temples were tablets which taught religious lessons.

The House of the Pigeons is another unique structure. It may appropriately be called the Quadrangle of the Nine Gables, for it bears upon its roof a colossal comb in the shape of gables built of masonry at an enormous expenditure of time and labor, each of the gables perforated with thirty rectangular window-like openings in seven horizontal rows. From the face of these gables are seen projecting stones, and there can be little doubt that this colossal comb was built for the purpose of embellishing the building, and holding aloft its sculptured ornaments.

In front of the Governors house eighty feet from the stairway Stephens found a picote which was probably used as a sun dial, and sixty feet further east the double headed animal throne shown in the cut.

The object of this is unknown, but it may have been a throne on which the sun was supposed to sit.*

In the same region, ten or twelve miles from Uxmal, is an ancient city called Kabah, concerning which very little is known. Sixteen different structures were discovered here by Mr. Stephens, located in a space about 2,000 x 3,000 feet. Mr. Charnay also visited the same locality, and described it as follows:

"Kabah was an important city, to judge from its monuments, consisting of high pyramids, immense terraces, triumphal arches and stately palaces. One palace is so richly decorated that the architecture entirely disappears under it. Two salient cornices form a frame to immense friezes, which in their details would compare to our proudest monuments. The interior has a double range of apartments, the finest we have yet seen, supported by half arches of overlapping stone. One of the inner chambers is entered from the front by three steps cut from a solid stone, the lowest step taking the form of a scroll. All the apartments had their walls painted with figures which were of brilliant colors, and which must have greatly enhanced the striking effect produced by this semi-barbarous, yet with-all magnificent edifice.

The second Palace is likewise reared on a pyramid. Its outer walls are plain except three short groups of pilasters, each surrounding the edifice above the cornice, forming a sloping, rather than a perpendicular frieze. The front is pierced by seven openings; two have columns and primitive rude capitols. The ornamental wall narrows toward the top, and is distinctly seen through the vegetation covering the roofs. There are remarkable bas reliefs at Kabah that represent a conqueror in rich Yucatec costume, receiving the sword of a captive Aztec."

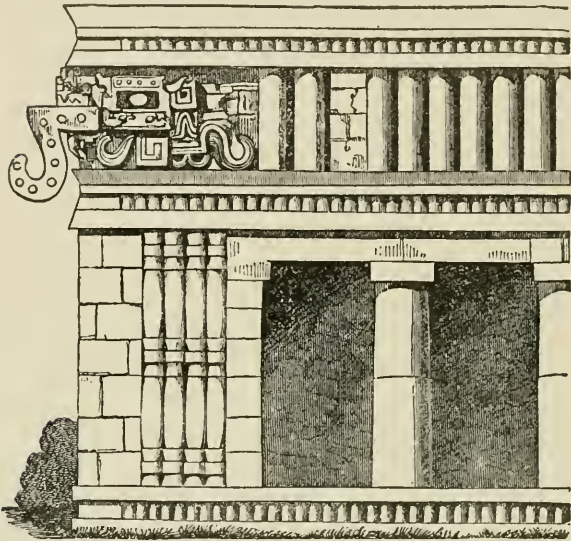
On the Island of Cozumel in the vicinity, a small temple contained a grotesque doorway which differed from any other. It consisted of a series of supports with two heavy stone lintels, but in the middle, supporting the lintels was a column with a capitol, and carved upon the column was a kneeling figure in a distressed attitude as though bearing up a heavy weight, thus making a caryatid.

At Zayi, is a ruined city, of which the principal edifice is called the Casa Grande. It is built in three receding stories. A stairway, 32 feet wide leads up to the third story on the

*This has been described in my work on Myths and Symbols.

front, and a narrower stairway to the second platform on the rear. The portion of the front is shown in the cut. Ranges of pillars or pilasters compose the bulk of the ornamentation, both above and below the cornice. The lintels are of stone, and many of the doorways are of triple width, in which cases the lintel is supported by two rudely formed columns, about six and a-half feet high, with square capitals. The only other monument is an immense terrace about 1,500 feet square, a building reached by steps, the interior wall decorated with a row of pilasters.

At Labna, are ruins of buildings equal in extent and magnificence any in Yucatan. In one case a mound of forty-five feet

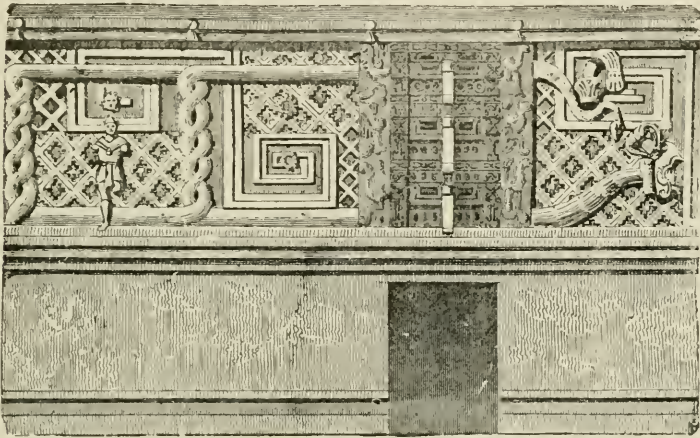


PALACE AT ZAYI.

in height supported a building 20x43 feet of the ordinary type. In the corner of this building is an ornament which presents the open mouth of an alligator or monster, from whose jaws looks out a human face, but along with it are other ornaments composed of grecques, rosettes, scrolls, and palm leaves.

II. The ruined city Chichen is next to be studied. This belongs to the same group with that of Uxmal, Kabah and Izamal, but has some features which are not found elsewhere. In the first place it is built on a plain which is remote from any stream, and is surrounded by a sandy plain, but is supplied with water from two wells or cenotes, which are sunken in the rocks, both of which were sacred. The city abounds with pyramids which resemble those at Uxmal, Palenque, and other cities of that region, upon which Temples, Palaces and other buildings were erected. There are over a dozen temples in various stages of ruin, all of them decorated with the same barbaric ornaments which are found in the other cities of the region. The Temple called El Castillo or Castle, and the Temple of Tigers are the most notable. Another peculiarity of the city is that it abounds with columns, and in this respect differs from Uxmal, but resembles those at Cozumel, at Zich-

mook, at Zayi, Labna, and Copan. The chief peculiarity is that the serpent is so conspicuous in its ornamentation. We have seen that the serpent was an ornament in the façade of the Palace at Uxmal and at Kabah, but here it was sculptured not only upon the façades of the various buildings but served as balustrades for the stairways that led to the temple; its body formed the columns which stood at the doors of the temple, the head and tail serving as the base and capital for the columns. It also took the place of the snouted mask or Manitou Face, which was so prominent at Uxmal. Its head projected beyond the corners very much as the hooked ornament that was common elsewhere. An explanation of this peculiarity



SERPENT FACADE AT UXMAL.

may possibly be found in the custom which was common farther north of taking some particular totem or a nature power for a guardian divinity, the serpent serving the same purpose here that the Manitou Face did at Uxmal, the Gigantic Human Face at Izamal, the portrait columns or stelæ, at Copan, and the various idols did at Zapatero.

There was in Mexico, as we have seen, an image which contained the combination of the human forms and human hands with serpent heads, tails and fangs, the whole decorated with a royal drapery. There were altars also at Copan which were as grotesque and forbidding as these serpent figures; while in the Usumatsintla Valley, according to the researches of Maler there were many human figures which were highly ornamented, each city apparently having its own peculiar style of ornamenting the temples and palaces, and its own models for sculpture; otherwise the description of Chichen-Itza is only a repetition of Uxmal, for a similar arrangement of buildings, general form of architecture, and form of government prevailed in each.

The columns were sometimes above the cornice and sometimes below; the serpent figure was sometimes seen on the facade, and again on the sides of the stairways. The statues and human heads and masks were placed above the cornice.

The serpent balustrade at Chichen presents the same symbol as the serpent facade at Uxmal, and suggests the same mythology. The double headed serpent on the Casa de Monjas resembles the symbol which was so common on the northwest coast, and reminds us of the coat of arms which was common in Sumatra. These figures were generally placed over the



PALACE WITH COLUMNS AT KABAH.

doorways in all these regions, as they are over the doorways at Uxmal, and suggest a contact between the two continents though there is just difference enough between them to make it difficult to prove that they had a common origin.

The banded columns, however, are peculiar to Central America, but are very common there. A good specimen of these is seen in the cut which represents the palace at Kabah. Kabah seems to have been an important city; it consisted of high pyramids, immense terraces, triumphal arches, and stately

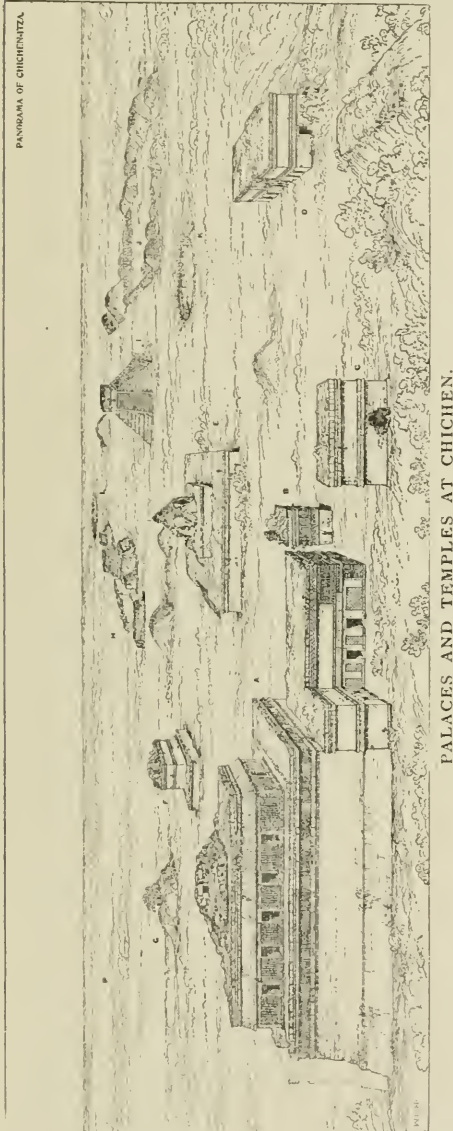
palaces. Charnay says: "The front of the first palace was richly decorated with figures like those at Chichen, calling to mind the gigantic wooden idols met with in the Islands of the Pacific." The second

palace is decorated with groups of three short pilasters arranged on the sloping frieze. Below the cornice are seven openings, two of which have columns and square capitals. The building seems to have had two stories; though the first is nearly buried under the debris which has fallen from the ruins.

Chichen, Mr. Holmes says is the most important group in Yucatan. Although it has no single ornamentation to rival the Governor's Palace, or Nunnery Quadrangles at Uxmal, it outranks that city in the number and variety of its remains.

In plan and dimensions the buildings are greatly diversified. The pyramid temples, of which there are over a dozen in various stages of ruins, may be regarded as the prevailing type. The ground plans generally show very simple arrangements of corridors, vestibules or chambers. The most unique features are found in the "caracol" or the "round tower."

"The panoramic view presents in the foreground the group of the



Nunnery or Palace A, with its annexed buildings; B, and C. To the right of this is the box-like form of the Akab Tzib, D. Beyond and over the east end of the Palace is the

Caracol or Round Tower, E. To the left of this is the Red House, F; and beyond over the top of the temple is the ruined Pyramid Temple, G. Near the center of the picture is a small pyramid, and beyond this is the Ball Court, or Gymnasium, H. The Castle El Castillo, with its lofty stepped pyramid, I, is a little to the right. Still further on are two temple pyramids with extensive ruins, J. Two cenotes, one at K, in the middle of the picture, and the Sacred Cenote, L, about a mile from the point of view."

The Palace or Nunnery is the most notable building here. The main building is composite in character, and represents two or three successive stages or epochs of growth. The fine second story structure belongs to the original period of building, and it is surmised that the small crowning structure is of late date, possibly representing the latest stage of growth. In the decorative features this group of structures is of exceptional interest.*

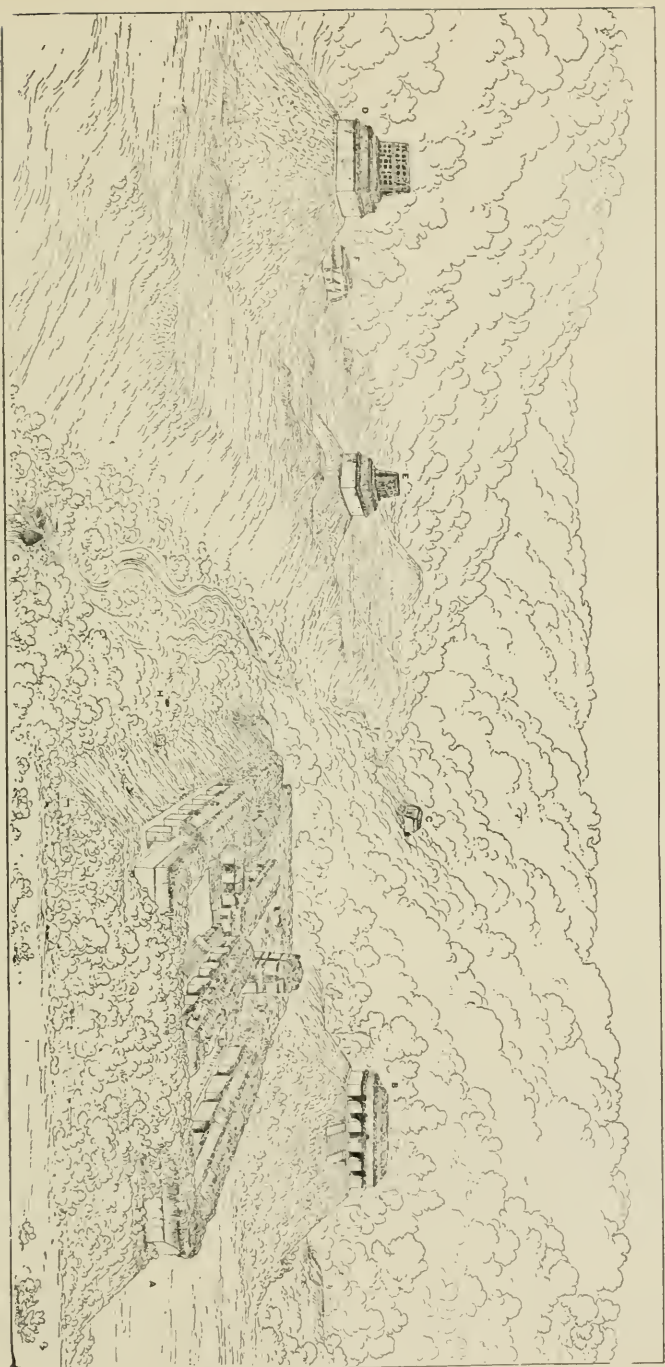
The most unique structure in Yucatan, is the caracol or Winding Stair, so-called because of a spiral passageway extending upward through the columnar central mass of the building. The ruin comprises three principal features, a wide foundation terrace, a small upper terrace, and a turret-like superstructure. The lower terrace measures about 220 feet from north to south, and 150 feet from east to west, and is 20 feet high. The stairway is on the west side, and bordered originally by balustrades, formed, as in other cases in Chichen, of colossal serpents with heads resting on the ground. The second terrace is some 60 or 80 feet in diameter, and 12 feet high; the ruined turret is 39 feet in diameter and nearly the same in height. The central core is about seven feet in diameter, and eight feet at the spring of the arch.

The El Castillo, or Castle, is the noblest monument of Chichen. It is a pyramid temple of the first order. It is as nearly as consistent a unit of building as can be found anywhere in the Maya countries.* (The Temple of the Tigers has been described under the head of ancient temples).

III. The ruined city of Palenque, is perhaps the best known of all those found in Central America, and the literature concerning it is quite voluminous.

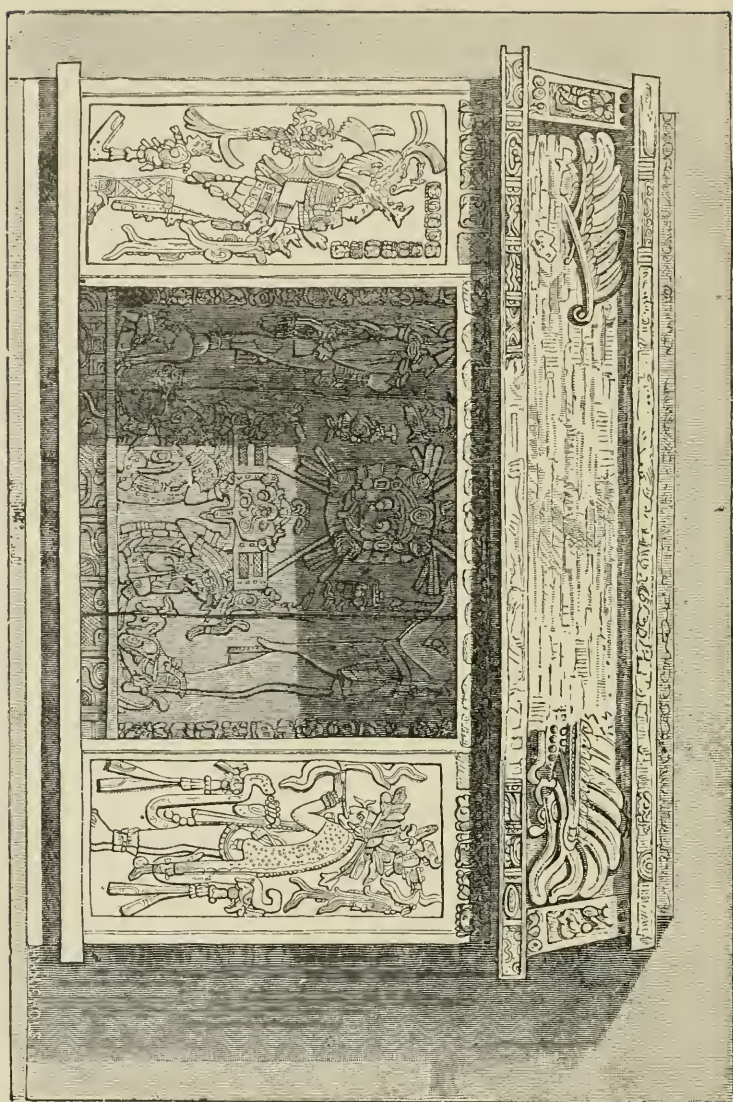
"The natural advantages of this region seem to have been fully appreciated by the aboriginal Americans, for here they erected one of the grandest cities, or religious centers, which as a ruin has become famous throughout the world. Since their discovery in the middle of the eighteenth century, the ruins have been carefully explored. Waldeck and Stephens are perhaps the best authorities, but the reports of Del Rio,

*A cut representing this building with its decorations, may be seen in the chapter on "Ethnic Styles in American Architecture," page 245.



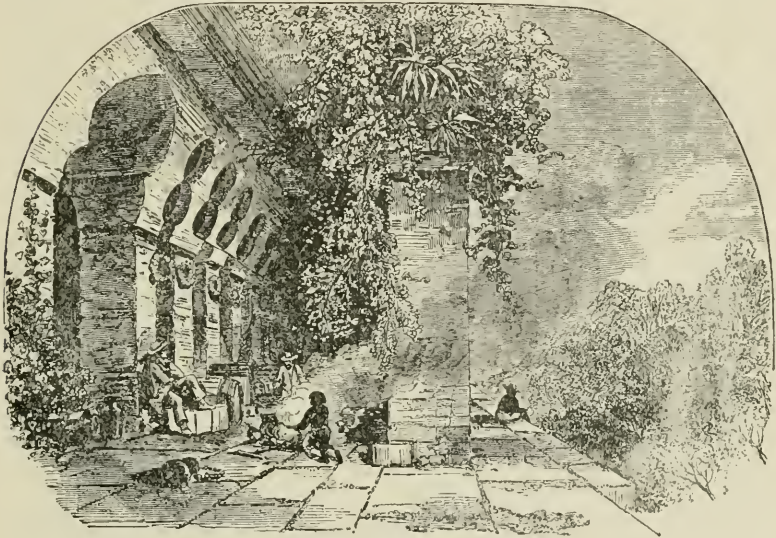
PANORAMA OF PALEOLOGUE

TEMPLE OF THE SUN AT PALENQUE.



Dupaix, Galindo and Charnay, afford much valuable information."*

Mr. W. H. Holmes has visited the spot and made an excellent panorama, and has described the buildings in detail. The peculiarity of the ruins is that they present one great palace with several temples surrounding it, giving the idea that it was the seat of power for one of the local chiefs or kings of the country, who with his priests ruled over the region, but made the temple a place of resort for all of the people surrounding, the symbols in the temples indicating that they were sun worshippers, and also deified the nature powers. There is no city



ARCHED CORRIDOR AT PALENQUE.

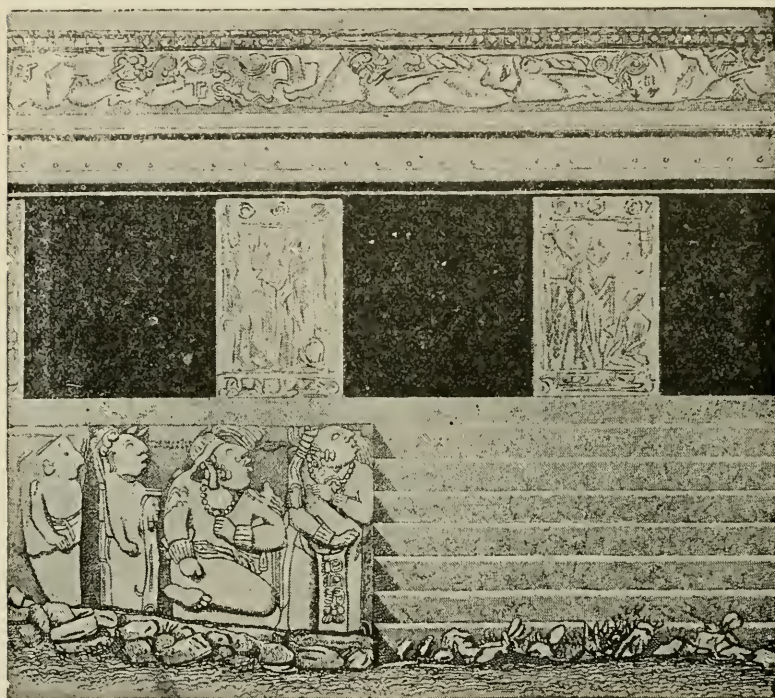
in Central America which furnishes more religious symbols, and certainly none that are so expressive.

"The Palace A, is seen in the foreground; beyond rises the lofty Temple of the Inscription, B; further up the stream, set in against the hill side, is the Temple of the Beau Relief, C. At the left, across the gorge, are three buildings crowning as many pyramids; the first at the left is the Temple of the Cross, D, seen from the back; the second, to the right, is the Temple of the Sun, E, also seen from the back; and between these and a little further away is the Temple of the Cerro, or Cross No. 2 of Charnay, F. In the immediate foreground may be detected the arched opening, G, of the mysterious waterway through which the Otolum passes for several hundred feet."

*The cut gives a clear idea of the doorway and the trefoil niches, but is defective in that it represents the niches as extending downward to the floor. The position of the medallions, the piers, the pavement, and the esplanade, are all shown in the cut.

The unique feature at Palenque is the great cluster of buildings called the Palace, which consists of a remarkable elevation with quadrangular base, measuring 260x210 feet, 40 feet high, and sloping sides with traces of a broad central stairway on the north, the sides faced with regular blocks of hewn stone.

"The summit platform of the pyramid supports the palace which covers its whole extent save a narrow passage near the edge, the exterior dimensions of which are 180x228 feet, and

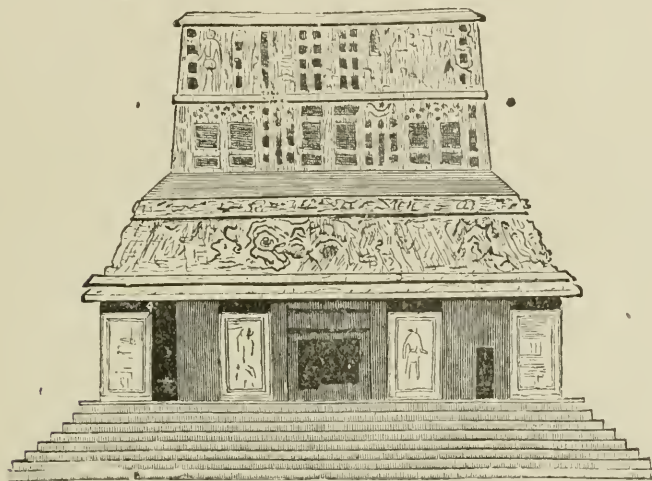


PALACE STAIRWAY AT PALENQUE.

30 feet high. The outer wall was pierced with about forty doorways, which gave the whole the appearance of a portico or corridor with wide piers. The double corridors present the form of an arch with a middle wall pierced by arched doorways which have a trefoil shape, and give to the entire structure an artistic appearance. The middle wall has a series of medallion-like heads, possibly portraits, neatly worked out in relief and surrounded with roundish framework. There are openings penetrating the middle wall to the right and left of the doorway, trefoil in shape above the medallions. The doorways are $8\frac{1}{2}$ feet high by 9 feet wide. The whole exterior was covered with a coat of hard plaster, and there are some

traces of a projecting cornice that surrounded the building. This was pierced at regular intervals with small holes designed for the support of poles on which were curtain hangings; which served as screens for the doors.

The chief entrance to the palace was on the east, fronting the stream. Of the piers separating the doorways, only fifteen have been found standing, eight on the east and seven on the west. Each contains a bas relief in stucco representing human figures in various attitudes and having a variety of ornaments and insignia. The faces are all in profile, and the foreheads invariably flattened. This cranial form was undoubtedly the highest type of beauty in the eyes of the ancient artist. Many have believed that the builders of Palenque, were the priest



TEMPLE OF THE CROSS.

leaders of an extinct race. Their foreheads were naturally imitated by their descendants.*

Passing through the doorway we enter the court, 70x80 feet, its pavement like other courts being eight or ten feet below that of the corridors. The court is bounded on the north and east by the walls or piers, of the inner corridor, and on the south and west by those of the interior buildings, C and D. The piers are yet standing, and each has a stucco bas-relief, though they are much damaged. Broad stairways of five or six steps lead down to the level of the court. The eastern stairway is thirty feet wide. On each side of it are sculptured stone slabs, inclined at about the same angle as the stairway, presenting in low relief a group of human figures in peculiar attitudes, all of them with retreating foreheads.

*The custom of flattening the head prevailed among the tribes along the Gulf of Mexico at the time of the Discovery.

The temples or shrines of Palenque form the most interesting features of the group. These have been described by various explorers.

The panorama represents their location, relative size and appearance. The Temple of the Sun can be seen in the center of the panorama surrounded by two groups of platforms or pyramids; its roof cone rises high above the mansard roof.



TABLET OF THE BEAU RELIEF.

There are three tablets within it which give the name to the temple. The central tablet represents a hideous face or mask with protruding tongue, which is supposed to represent the sun. This mask is suspended to a sort of frame which stands on a kind of altar which is supported on the backs of two crouching human figures. Two priests stand on the backs of

other stooping men, and are in the act of making human offerings to the sun. The temple is so constructed that the mask, or face, is inside the shrine, which has a roof and cornice of its own, but receives the light through the doorway.

The Temple of the Cross (D) has the same shape as the Temple of the Sun, but instead of having a mask fixed to the wall, it contains the Tablet of the Cross composed of three stones, and represents two men clad in the insignia of their office, making an offering to a bird perched on the summit of the cross.†

Stephens says of the two priests, that they are well drawn,



STATUE OF TLALOC.

and in symmetry of proportion are perhaps equal to many that are carved on the ruined temples of Egypt. Their costume is in a different style from any heretofore given, and the fold would seem to indicate that they were of a soft pliable texture like cotton.

The Temple of the Beau Relief measures 18x20 feet

twenty-five feet high, and apparently fronts the east. It presents the peculiarity of an apartment in the pyramid immediately below the upper rooms. On the rear wall in the upper room is the Beau Relief in stucco, the finest piece of stucco work in America. It represents a chief seated upon a globe, the globe resting on an animal-headed throne. Mr. W. H. Holmes says that as a work of art this bas-relief would not suffer by comparison with representative relief sculptures of Egypt, Babylonia and the far East, and in balance of parts and grace of line has few rivals. The right hand of the figure is extended as if to call attention to the inscription toward which the face is turned, while the left hand is raised, the index finger pointing upwards.¶

The Tower at Palenque is the most conspicuous and important building. It has been described by Mr. Holmes:

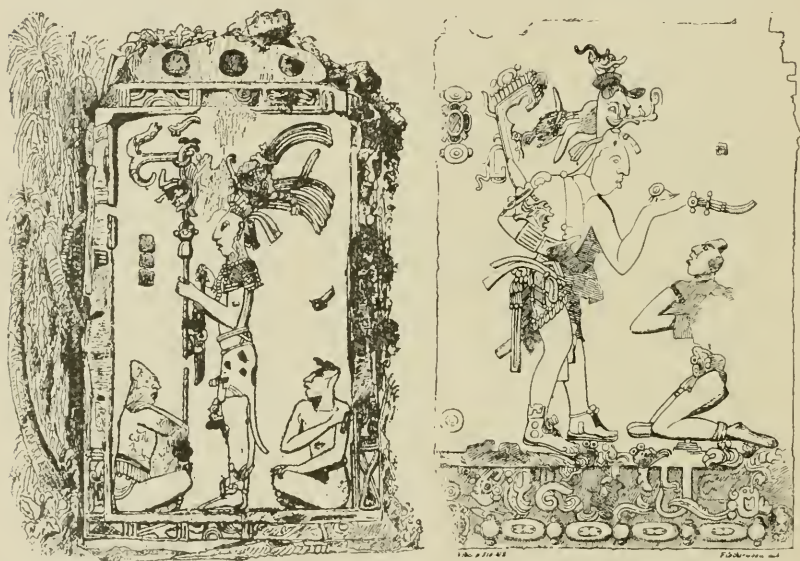
"It is a square building of four stories, three principal and one inferior, and has a stairway extending up through the center of the four floors. It was probably an observatory, the upper windows and roof commanding a view of all the surrounding buildings. It is seen in the panorama, and its height

†See plate.

¶See cut.

—suggestive of the feudal citadel—lends an air of the picturesque to the pile of ruins. The upper story is half gone. The doorways or windows are broken out above. The masonry has been denuded of coatings of plaster or color. The stairway and windows are manifestly the main features. The enclosed spaces or galleries are only wide enough to serve as passage ways from window to window or stair to stair. The stairway is twenty inches wide, and has a masonry walk. The second story repeats the first story very closely."

The western court measures about 30x80 feet, and has a narrow stairway leading up to the central building (C). In the southern court (D) stands the structure known as the "Tower," well preserved. Its base is about thirty feet square, and rests like the other buildings on the platform of the pyramid some eight or ten feet above the courts. The construction



SCULPTURED DOORWAYS OF THE TEMPLE AT PALENQUE.

of the interior buildings is precisely the same as the main corridors, though they have traces of rich ornamentation in stucco.

This ornamentation was drawn altogether from the religious practices of the people, but it is at the same time suggestive of the stage of art which prevailed among the people. It often, however, contained a sort of picture writing which becomes very suggestive as to the events which occurred. This will be seen in the cuts which represent captives looking up as supplicants to chiefs or kings. There are, however, other tablets which reveal the appearance of the kings, and especially their apparel and attitudes.

• We are convinced that there was far more culture among this people than could be found among the wild tribes of the north, but there was at the same time a strong religious feeling which kept the people in abject servitude to the priests and kings.

This may be learned from the temple architecture which prevailed, and especially from the tablets found in the temples. In fact, it is the opinion of those who have compared the hieroglyphics at Palenque with those found on the stelae at Copan, and with those recently discovered on the piers and lintels and altars at Piedras Negras, that a homogeneous people formerly dwelt in this region, whose history dates back to 300 and 113 B. C., but whose migrations took place at some unknown period. That there was an Archaic nation is evident from the inscriptions that have been found on the ruined structures of Tobasco, Chiapas, Yucatan and Central America, for these seem to contain a similar calendar system and a similar ritual; and yet the freshness of the inscribed tablets and other facts would refute the theory of an extreme antiquity.

It appears that the priests were the learned class, but they used pictographs which could be easily understood, and yet employed hieroglyphics and symbols which hid their knowledge from the people.

One peculiarity about the temples of this entire region, including those at Lorillard, as well as those at Palenque, is to be noticed. They not only contained sculptured tablets in their interiors which represented the various religious ceremonies which were practiced, and the Native Divinities which were worshipped, but also exhibited the same things on their facades. The lintels and piers which surrounded their doorways were covered with these strange figures. Illustrations of these are given in the cuts, two of which are taken, from Stephens engravings of the doorways in front of the Temple of the Three Tablets at Palenque, and outlines from Charnay's photographic drawing of the Lintels of a Temple at Lorillard. Charnay's description of the latter is given in the following words:

"The high reliefs are lintels from a small ruined edifice at the foot of a pyramid, are of great interest and marvellous richness of detail. The figure to the left holding a sceptre in his right hand with an aigret on his huge head-dress, similar to that in the palace at Palenque. He may be a King, or more probably a priest of Quelzalcoatl. Both figures wear the usual dress but the priests' medallion is a gem of art."

The cut represents a religious ceremony in which a kneeling figure has a rope filled with thorns passed through the tongue — while the other, the priest, holds over him a huge palm, encouraging the person to go on with the penance. Sahagun says:

"They pierced a hole with a sharp knife through the middle of the

• See 19th Annual Report of the Bureau of American Ethnology, 1897-98, page 809.



TABLET INSIDE THE TEMPLE OF THE CROSS.

tongue, and passed a number of twigs, fastened to a long cord through the tongue—which done by the penitent, his sins were forgiven."

Mr. Teobert Maler has spent considerable time in examining others, and has made a report of some of them to the Peabody Museum of Archaeology.

At Piedras Negras he found the most interesting series of monuments and ruined buildings which constituted the different parts of a city which was perhaps, once as magnificent as Palenque itself, and what is more, a series of altars and slabs,



SCULPTURED LINTEL AT LORILLARD.

on which were sculptured some of the most interesting figures that have ever been found on the continent. Here was a platform with a stone stairway leading to the second terrace, which was adorned with eight large stelae on which are sculptured many highly wrought figures. Above this platform were the ruins of two temples, and still further up was an acropolis, the only one that has been discovered in this entire region. The description of the stelae is contained in the report, and illustrated by a series of heliotype plates. It is impossible to describe these in the short space left us, but they show the barbaric splendor with which the kings and princes of the ruling classes of this region adorned themselves. From them we may learn much concerning the textile fabrics, the feather work, the jewels, and jewelled breastplates, necklaces, capes, wristlets, bracelets, capes, sashes, maxtli, anklets, diadems and crowns which were worn by old and young. Nothing that has come down to us from the ancient Mycenaean times of Greece, or from the Babylonian Empire exceeds in elaborateness of ornament and decoration the dress and regalia worn by these mysterious and unknown Princes. There was a barbaric splendor which has long since passed away, but was most surprising in its variety and abundance.

The figures of kings and queens, and even of the royal

family, are represented on the slabs and stelae, and even by the sculptured ornaments upon the piers and lintels of the palaces, which are truly astonishing. There are statuettes extant in England and in this country, two of which are in the possession of the writer, which represent Sardanapalus and his queen, the proudest monarchs of the Babylonian Empire, but if we are to judge from comparing these with the sculptured figures upon these slabs found in the midst of the deep forests of Central America, we should say that more expense and effort had been laid out by the unknown monarchs of this region in decorating their persons and the interior of their palaces with the habiliments of royalty than by these kings of the East. There is a profusion of jewels, and of precious stones, and of finely wrought needlework, and feather-work which was unknown in the palaces of the East, all arranged so as to astonish the eye by the brilliancy.

The comparison of these palaces in America with those which have been discovered in Cyprus, is suitable to engage our attention before we close this subject. The explorations by Mr. Arthur J. Evans have shown that a prehistoric civilization prevailed in Greece, Asia Minor, Egypt, Cyprus and Palestine, which resembled that which existed in America at the time of the discovery. The condition of art was perhaps at a higher stage, and the people were more advanced in many respects. Yet hieroglyphics and linear signs were quite similar. Architecture was scarcely more advanced. There were cyclopæan ruins and cities and strongholds, beehive tombs, vases, votive bronzes, engraved gems, demonstrating the fact that the great days of the Island story excelled the early historic period.

CHAPTER XX.

BURIED CITIES IN HONDURAS.

One of the strange things about the prehistoric races of this continent, is that their origin and early history is involved in so much obscurity. This is true of the uncivilized races of the north, but it is especially true of the civilized races of the south and southwest. Certain names have indeed been given to these races, and these names have become suggestive of a certain stage of civilization and style of architecture; but as there are no records which can be relied upon, we are left mainly to the study of their works to understand the differences that existed between them. The evidence is that civilization began among the Mayas as early as the Christian Era, and from their original abode in Central America, gradually spread northward until it reached the borders of Mexico, where it was taken up by the far famed Toltecs, whose history is so obscure, and finally was transmitted by them to the Aztecs or Nahuas, who came down from the north and settled in the beautiful valley of Anahuac, or Mexico.

Various writers have undertaken to describe this civilization, some of whom have magnified its importance, and represented it as fully equal to that which appeared in the East long after the opening of history; while others have imagined it to be scarcely superior to that of the wild tribes of our own country. So many cities have, however, been recently discovered in the different parts of this region which have thrown additional light upon the subject, that we are now without excuse if we have not formed a pretty correct idea as to their true character.

Some of these cities lie buried beneath accumulated ruins and have lost all semblance of their original state; others have remained hidden in deep forests, and have only within a few years been discovered.

To these buried cities we shall call attention in this chapter and from them gather illustrations which may help us to understand the difference between the architecture of the three races about which we have spoken.

We begin with the city of Copan which is in reality a Buried City, for the most interesting parts of it have long been buried, and have only recently been brought to light by the exploring parties which have been sent to the locality. These ruins are situated in Honduras, twelve miles from the frontier of Guatemala, in a beautiful valley, watered by a rapid running stream, shut in by mountains that rise to the height of about 3,000 feet. The earliest description of them was given

by Palacio, in 1576, who speaks of them as ruins and vestiges of a great population, and of superb edifices, of such skill and splendor, that it appears that they never could have been built by the natives of that province. From Palacio's visit for two centuries and a-half the ruins remained in total darkness, but in 1839 Mr. John L. Stephens visited them in company with Mr. Catherwood, and in 1885 Mr. Alfred P. Maudslay made the first attempt at an extensive and careful exploration. Others have followed, among them Mr. E. W. Perry, in 1889; Mr. Marshal H. Saville in 1891; Mr. John G. Owens in 1892; Mr. G. Byron Gordon, and Mr. A. P. Maudslay 1893; the last three named being under the direction of the Peabody Museum.



PANORAMA OF COPAN.

It may be said that Copan differs from other cities in Central America in several respects. (1) In the first place it is situated on the banks of a stream which is rapid enough to undermine the foundations of the city. (2) Its situation was upon the side of a hill which was so cut down that part of the city containing the Great Plaza was lower than another part on which some of the temples stood, the upper area extending for many feet to the north. (3) The chief point of difference is that underground ruins have been discovered which show great age, as a succession of buildings have been erected one upon the other.

These points have been brought out by the various exploring parties which have been sent to the region under the auspices of the Peabody Museum, from whose reports we shall freely quote.

The interiors of all the raised foundations and buildings, show signs of having been carefully laid for solidity and strength. Some of them have underground walls and interior casings which were the remains of older buildings which had been occupied for a time, and abandoned in the gradual building up of the city. The process thus carried on for centuries without any well designed plan, left the complex mass of structures a puzzle to perplex the explorer. There are other evidences that point to several periods of successive occupation. The river front presents what looks like three great strata divided by floors or pavements. In the interior of the main structure are two enclosed courts; the sides of one are built up in solid seats or terraces as in an ampitheatre. Underneath the courts are two passages, the openings of which can be seen on the face of the river wall, one above the other, and about the same length. The walls of this tunnel are built of well dressed stones, built up in the form of an arch of the usual style, with cap stones bevelled, but with no keystone. There is a constant down slope toward the river. The inner end of the tunnel is about 115 feet from the face of the cliff. Its floor is level with what seems to have been an old plaza now buried about 20 feet below the surface.

On the western side of the court is what Maudslay called the Jaguar Stairway. In the center of this stairway is a structure carved on its face into a huge dragon's or serpent's head, holding in its extended jaws a large grotesque human face. The western court is reached by a fine flight of steps of solid masonry. At a short distance to the south stands the stela and an altar, and above the altar on the slope of the pyramid, a raised structure formed of large steps having in large reliefs in front, rows of what have been called "death heads."

"Another building, one of the largest that has been explored, presents the remains of a grotesque face made of several stones similar to that in Chichen, also three female figures or statues representing singing girls, as the arms extend out in front as if about to clap hands when in the act of singing. Also other statues finely executed. Other sculptured figures are seen in a recumbent attitude, but finished in the round, and a large number of glyphs in which the human face predominates. The stairways are very numerous, and are very well built, but the ornamental carving which would represent the feathered serpent, grotesque human faces, with dress and ornaments, geometrical patterns, vegetable forms and inscriptions make it a notable place."*

The city contains a large number of pyramids, nineteen in all, of varying heights, some of which were surmounted by temples, others by palaces, and still others by religious houses, and between them were the various courts which are shown in the panorama, the western court, the eastern court, and the

*See Memoirs of Peabody Museum. Vol. I. No 1. page 12.

great Plaza to the south. The stelæ and altars, seventeen or eighteen in number, are all of them sculptured to represent kingly persons.

Oblong mounds with ruins of buildings on the summit, temple mounds with temples on them, platform mounds with no buildings upon them; broad stairways leading from the courts to the summit of the pyramid on one side, and down to the level on the other side, form a most striking features of the place, but the Hieroglyphic Stairway is the most curious of all.

The Great Plaza has the appearance of an amphitheatre, with ranges of seats or steps enclosing it on the northern eastern and western sides, while the southern side is open. Above the seats is an area which is bounded by a range of steps leading up to a more elevated terrace, on which are what appear to be remains of stone houses. To the northwest of the Plaza, extending as far as the foot hills of the mountains, is a large group of mounds buried in a dense thicket, and to the west another group and many pieces of sculpture, and scattered remains along the sides of the river for a distance of eight or nine miles. The sculptures from the terraces are also very interesting.

The monoliths, or sculptured columns, twenty-three in number, fifteen situated in the Great Plaza, present the most elaborate specimens of sculptured art. The average height is twelve feet, the average breadth, three feet. Ten or fifteen feet from the base of each is the altar.

Palacio says: "Six of the statues represent men covered with mosaic work, and with garters round their legs, their weapons covered with ornament; two were women with long robes and head-dress. They seem to have been idols, for in front of each is a large stone with a channel cut in it where they executed the victim, and the blood flowed off."

The most conspicuous form in the altar represents some fanciful grotesque animal; the glaring eyes and open jaws extending out from the side as if designed to excite terror in the spectator. It may be said that a similar altar has been recently discovered in the city of Mexico at a depth of about 20 feet.

There are other evidences that point to several periods of occupation. The river front presents what looks at least three great spaces divided by floors or pavements of mortar cement.

If these floors mark the various levels corresponding to different epochs in the history of the city, the question of the age of the ruins becomes still more complicated; for between each successive period of occupancy, there is the period of silence, the length of which can be inferred from the thickness of the structure. We see then that the history of the Maya race is written upon the ruins of the cities which were occupied, but the same is also true of the celebrated Toltec race. We shall therefore return to the buried cities, which are supposed to have been occupied by that remarkable people.

"The principal ruins are grouped around what has been called "the main structure," a vast irregular pile rising from the plain in steps and terraces and terminating in great terraced elevations; each topped by the remains of a temple. The summit of the highest of these is about 130 feet above the level of the river. * * The walls of the buildings and the outer casings of the terraces and pyramids are built of stone, neatly cut in flat-faced oblong blocks and laid in parallel rows. All these stone walls and casings appear to have been plastered, and the plaster decorated with paintings. There are many evidences that point to several periods of occupation as the river front presents, three great strata divided by floors or pavements of mortar cement.

"In the interior of the main structure are two enclosed courts paved with mortar cement, being sixty-five feet above the river. The sides of one court are built with solid stone work in seats or terraces as in an amphitheatre, beneath which was a tunnel formed by an arch of well dressed stones, large enough for a man to crawl through. A broad flight of steps leads to a narrow platform called by Maudslay the 'Stairway,' and in the center of the stairway a sculpture carved into a huge dragon's or serpent's head, holding in its extended jaws, a large grotesque human face; also a very well laid flight of steps with two large grotesque faces, and a human figure seated on a human skull, supporting in his hand the head of a dragon.

"There is another grand stairway the ruins of which impress upon the beholder a deep sense of its vastness and complexity and force upon him a conviction of what must have been from the beauty of its situation and the barbaric architecture, the effect of the city in its prime. Each step has a row of hieroglyphics running the entire length of its face, and for this reason has been called the 'Hieroglyphic Stairway.' In the plaza are thirteen stelæ, each having in front of it a sculptured block of stone, to which the name 'altar' has been applied. In the plaza is a pyramidal mound with stone casing in the form of steps.*"

A part of the Hieroglyphic Stairway, was first discovered by Mr. Owen in 1892. It appears that this stairway had been buried from the sight of previous explorers, by a landslide which had occurred at some unknown date, and which carried away the whole upper part of the stairway from its position, and covered the lower part, leaving only ten entire steps in their original position. A large altar was built into the stairway at the base. The top of the altar consists of four large slabs let into the steps. The sides were elaborately carved. Above the altar was a large seated figure built in

*The cut represents fragments of the stairway, taken out and laid in order below the pyramid, along with them the statue finished in the round, which was found near the middle of the stairway. There was an altar at the base of the stairway, and a seated figure halfway up, which seemed to be guarding the whole.

three pieces of stone, let into the center of the stairway. It represented a royal person arrayed in the usual elaborate adornment, with a massive crocodile head or crotalus jaw forming its crown. The figure was seated on a couch which was carved to represent drapery and fringes. The figure itself was represented as clothed with embroidered garments, every part of which was trimmed with cords and tassels, and covered with various raised figures. The usual sash or maxtli hanging gracefully down between the legs to the feet, which in turn were covered with highly decorated moccasins which resembled greaves, above which were fringed bands and tassels, making an ornament for each leg but left the knees bare.

A necklace of costly beads or shells hung upon the breast, and below it a cape set with jewels and precious stones. The



HIEROGLYPHIC STAIRWAY AT COPAN.

crown was hidden away underneath the massive jaws which turned the beauty into a hideous creature, thus mingling symmetry with deformity, and awakening in the spectator at the same time admiration and terror. A stela was also found on the stairway in a horizontal position, which resembles the stelæ which Stephens discovered in the Great Plaza; the only difference between them consisting in the fact that this was on its side, and the altar was below it, while those on the Plaza were standing erect and had the altars before them.

The significance of the stairway is that the inscription contains a chronological record which embraced long periods of time. The beginning glyph contains an initial date at the top of the staircase, but the finishing date was at the bottom

of the staircase. The glyphs on the stelæ which stand in the Plaza, perhaps correspond with those on the stairway, and refer to the year in which each was erected.

There are disconnected fragments in the stairway which represent human figures finished in the round, but lying on the side, the crowned head resting upon one arm, the legs crossing one another, but the wrists and ankles covered with the usual ornaments, while the fringed sash surrounds the waist, and the embroidered maxtli is in the usual place.

We may say of this Hieroglyphic Stairway that it is the most elaborately carved piece of work that has ever been discovered, and it shows the patience with which the sculptors



SCULPTURED TIGER FOUND BENEATH THE CITY OF MEXICO.

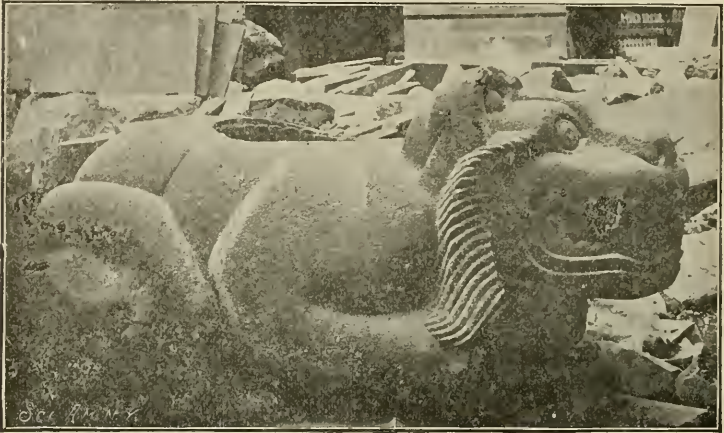
of this half civilized people did their work. It reminds us of the rock-cut temples of the Hindus, and especially those found in the Island of Java, where the temples were cut out of the solid rock, yet were covered with the most elaborate ornaments, the receding stones being carved into a great variety of figures.

There were at Copan certain ghoulish-looking sculptured figures which resemble those recently discovered in the City of Mexico, twenty feet below the surface, showing that there was a transmission from the Mayas to the Nahuas of symbols and ornaments in prehistoric times. Mrs. Maudslay speaks of those in the palace at Copan. She says:

Up to the time of this expedition in 1885, no traces of any houses had been discovered, but I found it difficult to believe that the great masses of masonry would have been built unless they were meant to serve as foundations for temples. As the work of clearing proceeded and we gained a better view of the great stairways and the outlines of mounds, my hopes of finding some trace of a temple was strengthened. Judge, then, of my delight when digging on the north side of the east court, I came on the unmistakable signs of a doorway, and the remains of an elaborate cornice running along the top of the interior wall of the chamber. * * * * *

The peculiarity of this doorway was that on either side of it and over the top there were carved in bold relief, a series of gruesome figures, consisting of grinning skulls which looked out from the pedestal. Above these, on either side, was a human figure, distorted and bent, and apparently in agony, supporting with his hand some monstrous reptile head, and above this a distorted human figure.

Another important feature of Copan is the one spoken of by Stephens and by all other explorers. It consists in the



ANIMAL ALTAR FOUND BURIED IN THE CITY OF MEXICO.*

number of sculptured columns or stelæ which represent either the chiefs and priests, or the divinities which were worshiped; probably the former, though it is difficult to decide, for the tendency of the times was to exalt the kings and priests almost to the level of the divinities, and to surround the palaces with even more magnificence than they did the temples. This explains the difficulty of identifying the statues or sculptured figures on the stelæ, and the fact that altars were placed before them increases the difficulty. The figures represent kings and queens who have been well fed, and who are magnificently clothed and covered with ornaments, but the divinities were

* The figure represented in the cut was found in 1901, while excavating for the foundations for the new Hall of Justice and Public Instruction. It is of basalt, 7 feet 6 inches long and 3 feet in diameter. A hollow in the back is 17 inches wide and 10 inches deep, and on the bottom of this cup are carved the emblems of the Tezcatlipoca, the God of Death. It was evidently used as a vase to receive the hearts of human sacrifices, and was in the Temple of Tezcatlipoca. The stone was originally in the colors of the living tiger. It weighs four tons, and the figure is gruesome. An account of it was published in the Scientific American and was illustrated by the cuts used above.



STELA AT COPAN.



STELA AT COPAN.

full of supernatural powers, which are represented by their faces and forms, and especially by the many symbols by which they were surrounded. It may have been the purpose in placing the altars before the statues of kings and priests, to increase the awe and fear which the people felt toward their rulers, and so increase their power, the religious sentiment and the sense of loyalty conspiring to make a wide separation between the people and the priests.

This same tendency seems to have prevailed in Mexico, for altars, carved in the shape of animals with glaring eyes and open mouth, have, as we have said, been discovered at great depth beneath the streets, suggesting the idea that before the time of Montezuma the same styles of art which have been so common among the Mayas at Copan, had been introduced into the city of Mexico; and it was the same element of fear which the kings and priests appealed to, the people being in abject servitude to their rulers.

This is in accord with the architecture of the ancient Mayas, for it seems to have been the chief effort of the sculptors to make the priests and kings as attractive as possible, but to place before the temples figures of animals and other creatures as terrifying as possible, as the chief element of religion was fear.

Many other cities have been discovered in Honduras which have been buried for many years. The city of Lorillard was discovered by Charnay in the year 1884. The number of monuments was estimated at fifteen or twenty, consisting of temples, palaces, and huts of the lower orders. These buildings, some sixty-five feet from the river, were supported on terraces rising in ampitheatre and resting on natural hills, which the builders made use of to save labor. They are usually faced with stone, have a central flight of steps, but are not so richly decorated as similar edifices at Palenque, but the inner decorations and the figures on the bas-reliefs are the same, and the general arrangement of the buildings is similar.

A temple on a mound 120 feet high, contained a great stone idol, the face completely mutilated, but bearing a great plumed headdress, and having on the shoulders the jeweled cape or necklace. The temple is pierced with three stone lintels, finely carved in the shape of lattice-work, resembling those at Kabah and at Uxmal. In the great frieze, three large panels were occupied by statues, which were still standing.

On an esplanade were six palaces forming a rectangle, one of these palaces having stone lintels finely sculptured. On one of these lintels were two figures with retreating foreheads, having the usual high headdress of feathers, cape, collar, medallion and maxtli, while their boots are fastened on the instep with leather strings, as similar figures are at Palenque. Each holds in hand a Latin cross; rosettes form the branches and a symbolic bird crowns the upper portion, while twenty-

three katunes or glyphs are scattered about the bas-relief. This was a symbolic representation of Tlaloc, whose chief symbol was a cross, which here consists of palms or maize leaves. (See cut.)

Two lintels from a small ruined edifice at the foot of a pyramid, represent two human figures; the one, holding a sceptre in hand, wears the usual dress of a king; the other exhibits a ceremony which was common: pulling the knotted cord, armed with thongs, through the tongue as a penance. Another temple, with two inscriptions on stone lintels, resembling those at Chichen and Copan, were found at Lorillard.



SCULPTURED FIGURES ON LINTEL AT LORILLARD.*

An altar panel in the temple of the Sun at Tikal is described by Maudslay, and a bas-relief on wood, which was a facsimile of the panels in the rear of the altar at Palenque. Other panels, consisting of scattered pieces, are seen on various monuments. Some of them contain inscriptions which are in perfect condition and furnish important analogies. A stela at Tikal resembles in some respects those at Copan, but differs from them in that the decorated figure stands so as to present a side view, but it is covered with the same gorgeous array of feathered headdress, jewelled cape, fringed garment, embroidered maxtli, ornamented sandals, wristlets and other articles.

* The decorations on these figures are quite similar to those on the stelæ at Copan.

We see in all these figures a display of barbaric magnificence, which is perfectly surprising when we think of the distance of these cities from any known civilization,—but this shows that there was a development on the soil of America which was certainly equal to that found in Babylonia or in Egypt at the opening of history, and even superior to that which existed in some parts of Asia at the time of the Discovery.

Other cities have been found in Umatsintla Valley and at Piedras Negras, which resemble those just described.

Mr. Teobert Maler has spent considerable time in examining these, and has made a report of some of them to the Peabody Museum of Archæology. He speaks of one locality named Chinikika, in which was a great pyramid, rising in several terraces, forming the substructure of the principal temple. Adjoining this is a pyramid, supporting an extensive palace, with several courts. On one side of the main court is a row of entrances, which are arched over with triangular arches. Here, was an altar covered with hieroglyphics, or incised inscriptions, upon its upper surface. At Chancala, he discovered a temple on the summit of a pyramid, with a broad flight of steps leading up to it, the frieze of which has a heavy cornice, but the interior was finished with an arched ceiling.

At Xupa, he discovered temples resembling the three well-known temples of Palenque. The inner chamber of one was painted a fiery red, faced with stone slabs, on which were the outlines of a lovely female form, having a high and graceful headdress, a pure Maya profile, a collar of network of beads, and a disk on the middle of the breast.

At Piedras Negras, he found the most interesting series of monuments and ruined buildings, which constituted the different parts of a city, and which was, perhaps, once as magnificent as Palenque itself, and what is more, a series of altars and slabs on which were sculptured some of the most interesting figures that have ever been found on this continent. Here was a platform with a stone stairway leading to the second terrace, which was adorned with eight large stelæ, on which are sculptured many highly-wrought figures. Above this platform were the ruins of two temples, and still farther up was an Acropolis, the only one that has been discovered in this entire region. The description of the stelæ is contained in the report, and illustrated by a series of heliotype plates. It is impossible to describe these in the short space left us, but they show the barbaric splendor with which the kings and princes or the ruling classes of this region adorned themselves. From them we may learn much concerning the textile fabrics, the feather work, the jewels, and jewelled breastplates, necklaces, capes, wristlets, bracelets, anklets, diadems and crowns which were worn by old and young. Nothing has come down to us from the ancient Mycænian times of Greece, or from the Babylonian Empire, that exceeds in elaborateness of orna-

ment and decoration, the dress and regalia worn by these mysterious and unknown princes. There was a barbaric splendor which has long since passed away, but was most surprising in its variety and abundance.

The figures of kings and queens, and even of the royal children, are represented on the slabs and stelæ, and even by the sculptured ornaments upon the piers and lintels of the palaces, which are truly astonishing. There are statuettes extant in England and in this country, one of which is in the possession of the writer, which represent Sardanapalus and his queen, the proudest monarchs of the Babylonian Empire, but, if we are to judge from comparing these with the sculptured figures upon these slabs, found in the midst of the deep forests of Central America, we should say that more expense and effort had been laid out by the unknown monarchs of this region in decorating their persons and the forms of their children with habiliments of royalty; than by these kings of the East. There is a profusion of jewels and of precious stones and finely-wrought needle-work and feather-work, which was unknown in the palaces of the East, all arranged so as to astonish the eye by their brilliancy.

There were other half-ruined structures containing remains of chambers, arched vaults, ruined vestibules, and numerous stelæ. A rectangular sacrificial table or altar, resting upon four pillars, was found. The description of the different stelæ and the figures represented on them are given by photogaaphs. It appears from the description that the royal personages were portrayed as arrayed in all their gorgeous attire, but in various attitudes; some of them standing erect, covered with woven garments of various shapes and patterns, mainly with fringed edging, and held in place by jewelled belts. On the heads were gorgeous crowns, above which many-colored plumes which reached to a great height, gave an imposing appearance to the person. In the hands of some of these persons were plumed wands, but the hands of others were placed upon the heads of captives, or were holding long spears which penetrated the bodies of the captives. The faces of the captives were turned upward, as if in an agony of supplication, but the face of the officer suggests triumph and power.

Some of the stelæ represent figures of gods or kings draped in royal garments. The one that is shown in the cut, represents a female, probably a queen, looking up to a child which is seated upon a throne above. The child has a gorgeous crown upon its head and a jewelled cape upon its shoulders. The throne itself was supported by a framework, which was evidently very elaborate and highly ornamental. Mr. Teobert Maler thinks it was a god which occupied the upper part of the stelæ, but, if so, the attitude and dress and general appearance was very human. The following is his description :

On the lower base line stands a person of rank, in profile, looking up to the god in the niche. He (she) is dressed in a long tunic which extends to the feet. In the right hand is a little leather bag, tied up with a fine cord, and in the left, a flabellum of green feathers with a red handle. At the feet of this exalted personage is seen a victim, thrown on what no doubt is a tiger skin, the face hanging down over the edge of the stone. The scroll work and the structure of beams resembles that in Stela 11.

Bright red scroll work runs up the right and left edges of the niche as far as the curtain, which is divided into four parts (that is, tied up with cord in three places), and has a horizontal band of six simplified glyphs (second manner of writing) above it. Above this band is a fantastic green mask, with red eyes and mouth. It is crowned by a diadem of large discs, with scroll work on either side and feathers on top.

All the sculpture described above, is in very low relief, but the bright red god, who sits enthroned cross-legged in the niche, in Asiatic fashion, is in very high relief, and is represented in front view. His right hand rests upon his right knee; his left hand, now broken off, held an ornamental pouch, with the appendage of conventionalized rattles, which, in this case, does not hang over the edge of the niche, but lies upon the floor. The breast is covered by a green cape of scales and a horizontal breastplate, but the latter is very much injured. The bright-red face of the god is smooth and beardless. The lips are wide apart, as if the god were speaking to the people. Large round ornaments are in the ears. The head is crowned with an elaborately executed serpent's head, surmounted by a fantastic human head. Both are for the most part green, the eyes and mouths only being red. The teeth in the serpent's mouth are saw-shaped. The little head is in its turn surmounted by an oval with the closed hand, which, being contiguous to the curtain, leaves no room for a crowning plume of feathers. Green feathers fall each side of the headdress.



SCULPTURED SLAB.

There are many other figures sculptured upon the stelæ, kings or gods seated upon thrones and within niches, but they are always crowned, and have the jewelled cape upon the shoulders. One stela represents a seated figure in what may

be called "European fashion" upon a stone bench, covered with a tiger skin. Both hands hold a sceptre with a grotesque face. In front stands a second personage, with a tiara upon his head. A snake curves down and over the two personages. Two emaciated and apparently dying forms appear upon the scroll work, while a third form, with extremely expressive countenance, bends down over the curved form of the serpent. Above all, is the bird, not unlike that which surmounts the cross at Palenque.

A warrior of high rank, represented in front view, holds a lance with a fantastic face in his right hand, a shield and an ornamental pouch on his left arm; his tunic, falling to the knee, has elaborate feather-work in front and a border of sea-shells. The girdle is almost, or quite, covered up, and from it fall sash ends, which appear below the feather garment and exhibit an elaborate pattern of Maya embroidery. The ankles and knees are encircled by ornamented bands.

To the right of the warrior chieftain, a captive kneels on the ground, with his arms bound together, holding his toothed sword, point downward, in his right hand. The distinguishing mark of a captive, in the form of two little glyphs, is carved upon the sword.

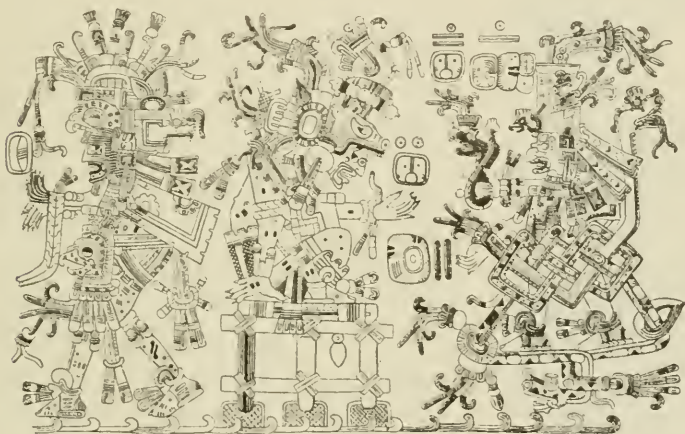
A buried city, or rather buried temple, has been recently discovered near the village of Carozal in Honduras. The site chosen by the builders, is one of the most favorable for many miles around, as it is on an extensive plateau 50 to 100 feet above the sea level, and about one mile inland. The soil upon the plateau is remarkably productive. The only apparent drawback was the fact that the nearest fresh water was several miles away, but the defect was remedied by the construction of underground reservoirs. The site was marked by about twenty artificial mounds, some of which were constructed over buildings; others contained pottery images near the surface, and on the ground level, painted pottery animal figures. The most remarkable feature of the locality, is that the mound-buried rooms, present a series of mural paintings, or frescoes, which contained the same figures that are seen in the temple at Palenque, but painted on the wall, rather than sculptured in stucco. One mound, near the edge of the plateau, was 86 feet long, 66 feet wide, and 14 feet high. A wall was discovered in it, about four feet below the ground level, with a triangular stone cornice, and above the cornice roughly-squared stones. The paintings, or frescoes, were on the wall inside of the rooms, and were in a good state of preservation. The floor was on a level with the ground outside. A plain stucco covered the interior of the building, but the painted stucco was separated from this by a layer of friable clay, which could be removed without damage to the painting.

The painting on the east wall was a rude outline of two warriors in contest. The painting on the north wall contained

ten figures, the first seven figures evidently represented a line of captives, as they are attached to each other by a rope, which binds their wrists; the rope passes over the right shoulder of the eighth figure, and is held by him with both hands, and ends with the ninth figure. All of the figures have very elaborate head-dresses, composed of plumes of red, yellow and green feathers. The figures have heads of dragons, and tigers' heads, also the head of an animal resembling a racoon. One of them seems to be standing on an animal. The ninth figure is standing upon a serpent's head.

On a portion of the north wall is a group of figures in varied attitudes, who have on their heads masks of animals, such as birds, serpents, eagle heads, and peccary. Birds' and serpents' heads are seen among the drapery. They seem to be undergoing some torture, being in constrained positions.

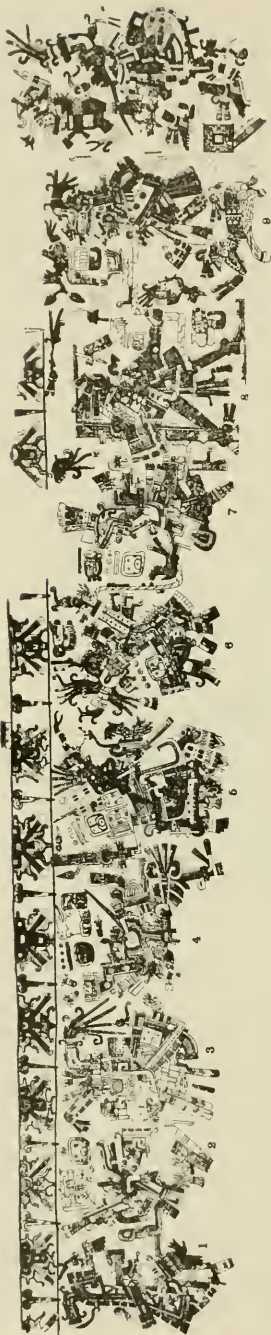
On the west side of the wall are figures making an offering of human heads, to a central figure, which seems to be an altar,



ORNAMENTED WALL OF BURIED CITY IN HONDURAS.

and has upon the outside a ghoulish looking head, with speech signs proceeding from its mouth, and is probably meant to represent Huitzilopochtli.

The general design of this temple painted on the stucco, appears to be continuous around the building, and represents first, a battle; next, the prisoners being led captive, some of them were in torture; finally, the worship of Quetzalcoatl, and the offering of sacrifices to the God of Death. The scene is divided as follows: first, eight figures in the last half of the north wall, represent the prisoners; the west half shows the worship of Quetzatcoatl, the god himself being depicted at the western extremity of the wall, elaborately dressed and ornamented. On the west wall, two heads and other objects are being offered to the Mexican God of Death. The figure offer-



FRESQUES ON THE WALLS OF A BURIED TEMPLE.

ing the heads—one in each hand—is obviously one of the victors, but there appears to be little or no difference between the appearance, dress and ornamentation of the conquerors and that of the prisoners, which would indicate that the combatants were, if not of the same, at least of kindred nations. This mound-covered temple was constructed entirely of large blocks of limestone, and it is unknown what age it belongs to. It may have been built during the migration of the Toltecs, who took a long journey of a thousand miles, between the twelfth and fifteenth centuries. If so, it gives us some idea of the mythology of the Toltecs, and shows that they were as ghoulish in their form of worship as were the Aztecs, or any other later race. There is a remarkable resemblance between these figures and those found at Palenque. The facial profiles are similar, and the head-dresses almost identical, and there is a strong similarity in the gift, or offering, and the mode of presenting it. The Palenque figures appear to be standing upon the heads of some monstrous animals, with open jaws, which might be called a dragon, and offers a child to the bird divinity that rests upon the top of the cross. There is, also, a striking resemblance between those figures frescoed upon the walls of these buried temples, and those which may be seen in the various calendars, especially those which have the form of the tree, as the figure seems to be standing upon the head of a dragon. There is, however, a considerable contrast between them and the figures which are found at Copan, for here the altars are carved into the most grotesque and unnatural shapes.

A description of the columns and altars at Copan will, therefore, be appropriate in this connection: On the front of each stela is the representation

of an elaborately dressed human figure, the ornamentation throughout the sculpture is, without doubt, symbolical, but is derived from the following subjects: the feathered serpent, grotesque human and animal figures, feathers and feather-work, bands and plaits of some pliable material, loops and ties made from softer material, geometrical patterns. Foliations and vegetable forms are lacking. The dress and ornaments are similar to those shown by all the monuments throughout Central America, and somewhat similar to those found in the Codices. There is little to help us to determine whether the figures are the portraits of chieftains and priests, in ceremonial costume, or whether they are fanciful representations of culture heroes and deities. The exaggerations of the personal adornments would be likely to occur in imaginative figures, or they may have been copied from the adornments seen on the diminutive figures which are carried in religious processions; still, the waist cloths, turbans, head-dresses, moccasins, belts, capes, and other articles seem to be imitative of those actually worn, and the jewels and ornamental precious stones used in the costumes, are such as abound in the region. The designs of the ornamentation are numerous, those of the feathered serpent are by far the most important, but the serpent symbol has passed through the stage of ornamentation and conventionalism. The rattles of the tail are drawn as a conventional ornament to the drapery.

The following description of the stelæ at Copan, compared with the plates, may aid the reader in understanding the figures and symbols. The first one represents a female figure. It stands on the north side of the great plaza; the body is far too short for the size of the head and limbs. The face is beardless, the mouth slightly open, the forehead is receding, the hands held up over the breast-plate, the feet turn outward. The head-dress is composed of folds of some stiff material. At the four corners of the head-dress are serpents heads without jaws, a close-fitting cape covers the shoulders and chest, made of heavy flattened plaits, and a row of flattened plaits of beads, with a fringe of feathers. Over the chest lies a breast-plate, the heavy panel of the breast-plate has at either end an elongated serpent's head, from the open mouth of which issues the head and shoulders of a human figure. A necklace of beads hangs around the neck, with a medallion in front; the left hand, and part of the bracelet on the hand, can be seen. Around the waist is a girdle, consisting of a broad band, divided into panels, each panel decorated with a symbolical design. On the middle of the sides, over each hip, is a human head, or a medallion; hanging from the bottom of the girdle is a heavy fringe, formed from some pliable material; above each of the heads is a looped tie; under the chin is a stiff plate, and beneath there are heavy folded tassels. Attached to the girdle, and hanging over it, are two bands, which reach around to the knees; from the cen-

ter of the girdle hangs an apron, ornamented with circles, bands, and dots. Broad bands, or garters, of beads and tassels are fastened around the legs, below the knees. The ornament of the ankles and sandals is similar to the bracelets, but knotted bands pass between the toes, and are fastened to the sandals. Above the plaited head-dress is a grotesque mask, or face; over each side of the head-dress is a grotesque human figure, with the feet resting on a serpent's head. A cord around the neck supports a breast-plate; the end of a cloth can be seen passing over the thigh and hanging down in front.

The next figure has the appearance of a Chinaman, the face is bearded and has what appears to be a moustache; the ears are furnished with pendants; the panel of the breast plate is ornamented with two symbols; on the apron is a face. The head-dress has the appearance of a turban, the ornaments having the appearance of elephants' heads are at the corners, though they may be intended to be the head of tapirs. On the upper part of the trunk are small eyes, resembling those of the elephants; above these are small human figures.

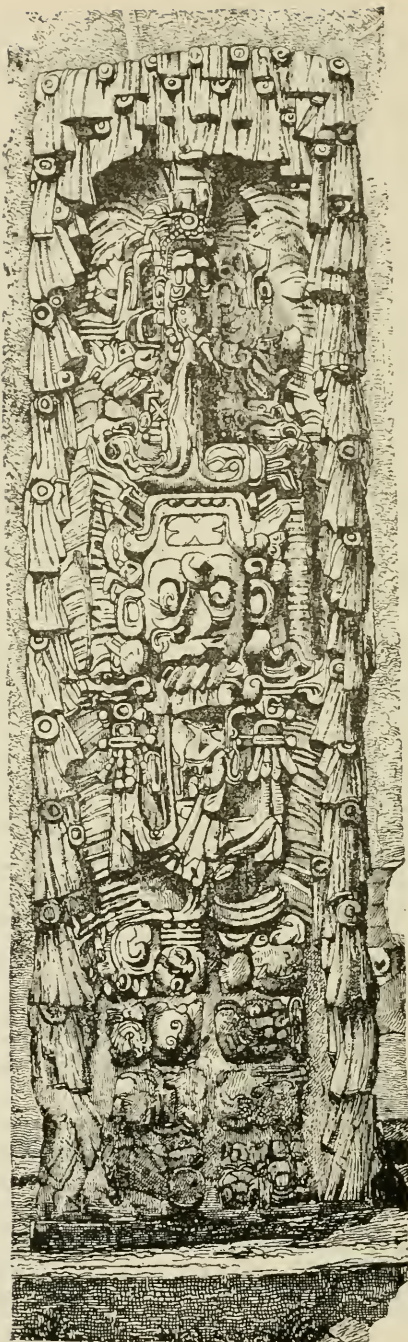
Down each side of the stela are three other heads, with elephants' trunks. The peculiar ornaments seem to arise from the breast-plate in front of the face. The back of the stela is decorated with a huge face or mask.

Another stela, not represented by a plate, has the face covered with a mask, through which the eyes and mouth can be seen; the serpent's head and scroll appears above the top of the ear; the center face is absent from the girdle. The side view presents a serpent's form, extending up and down the stela; issuing from one of these is a grotesque face, with a mingled scroll. The cape, or breast-plate, seems to be made of a large number of flat stones, possibly jet; a sort of framework is fastened to the shoulder pieces in front of the breast-plate. Both hands are resting upon the breast-plate, with ornamental bands about the waist; the apron is elaborately ornamented, and has a fringe on its borders, below which hangs a series of folded tassels; the maxtli is elaborately ornamented, and hangs to the feet, terminating in a large bow; garters made out of precious stones are seen below the knees; the moccasins are held with ornamental bands around the ankles.

Another stela stands on the north of the detached mound, and faces the east. The want of proper proportions in the principal figure is conspicuous. An altar stands before this statue, which is worthy of notice. It has in the front a human face, with prominent forehead; beneath which are two glaring eyes, the eyelids swelling out, so as to make the ball of the eye still more prominent; below the eyes is a short, projecting nose, with nostrils open; and below this, four large teeth, the gums of which can be seen; the mouth lacks the lower jaw. The sides of the altar present other figures, which are difficult to describe, but show much of the sculptor's art.



STELA H—FEMALE FIGURE.



BACK OF STELA H.

There are three carved altars, which are not mentioned by Stephens. One of these has at either end a huge serpent or dragon's head, resting on two skeleton arms, with claw like hands; the upper jaw is furnished with recurved teeth, but out of the mouth protrudes a human figure. Both of the dragons' heads are fringed with feathers. Another altar is in the shape of an animal, the body of which forms an arch, connecting the two serpents or dragons' heads.

Stela H is a female figure, with a skirt hanging down to the feet, on which are moccasins, and a very high head-dress, made of feathers, and a mask above the head; the skirt was apparently tiger's skin, with a cross barred work, made of long and round beads. On each side of the mask is an arrangement of serpents' heads, with the lower jaw fringed with feathers and tassels; the sides are similar to other stelæ. From the top of the scroll, spring two entwined serpents, with human figures holding the body. The back of the stela is very interesting. It seems to be draped on the edges with feathers and rosettes; in the center is a grotesque mask, with large ears and bulging eyes, with a peculiar ornament between the eyes; below the mask is a plaited ribbon from which hangs an apron; in the upper part, above the mask, is the figure of a bird, whose claws are grasping a bar, with two plumed serpents. From the mask hangs a tongue. An altar stands near this stela, but it is difficult to make out the figures on it.

Stela I is very interesting. It is nine feet high, and two feet nine inches wide. The face is completely covered with a mask, with a bulging eye; the ears project beyond the mask; snakes' heads are seen below. The breast-plate is reduced to a line of fringed links, representing a serpent's body, and the serpents' heads at each end have human forms issuing from the mouth. The three faces in the girdle are very grotesque. Above the head is a grotesque mask, with square ears, and around these are plaits and scrolls, and serpents' heads ornamented with a fringe below.

Stela N is the most elaborately carved stela at Copan. On the front is a large human figure, standing in the usual position, hands raised to the breast-plate; above the head are plaited folds, and at the top a mask; on either side is a plaited ribbon; the forehead is cross-hatched and bound around with a cord, knotted and looped; above the loop is an ornament resembling the inner part of the jaw of a dragon; the shoulders are covered with a cape with flattened plaits; the breast-plate is of the usual form, but over it are grotesque figures, issuing from serpents' mouths. The bracelets, girdles, apron, and garters, all have medallions. On either side of the mask over the head is a dragon's head, turned towards the sides of the monument, with a tasseled ornament attached to the end of its snout. Above the dragon's head is a large double scroll; at the base are grotesque figures, crouched—half-man and half-beast.

This brings us to the contrast between the stelæ at Copan and the frescoes in the buried temple. It will be seen from the plates that the statues are finished in the round; that the persons represented seem to be well fed, and sensible of their power. They are almost hidden amid their adornments, for the head-dress, with its plumes and mask, reached as far above the head, as the necklaces, bracelets, belfs, breast-plates, sashes, and skirts, did below. The jewels and gems were everywhere present, finished in the highest style of art. On the other hand, the figures in the fresco, while they are furnished with head-dresses, bracelets, sashes, bands, and mantles; yet are in better proportions and more natural, but show the sufferings of captives, rather than the pride and power of kings.

The same contrast may be seen between the figures in the stelæ at Copan and those represented in the tablets at Palenque. In the latter place we see the cross as the most conspicuous figure, but it is attended on either side by priests, who were clothed in cotton garments and very plain attire. They seem to be offering gifts to the figures on the summit of the cross, and have the attitudes of those who are engaged in religious ceremonies. These contrasts illustrate the skill of the artists, for they very clearly represent three conditions of society: the pride and pomp of royalty; the humility and devotion of the religious leaders, and the abject state of the captives. The common people not having been regarded as worthy of notice. Still the same religious symbolism is everywhere seen.

There is a large number of altars and stelæ at Piedras Negras. These are placed near groups of buildings, which are mostly in ruins, and also near great pyramids, which rise from several terraces and form the substructure of several temples.

Adjoining the north side of one terraced pyramid is an extensive palace, with several courts, on the side of the main court are several entrances, which are arched over with triangular arches. Traces of painting are still visible on the plastered walls. In front of the temple were eight stelæ. The description of the stelæ is interesting, because of their resemblance to those at Copan and Palenque. In one the front view presents a male figure, carved in very high relief. Upon the brow is placed the serpent's head, the upper row of teeth forming a diadem. Above the serpent's head is the turban, from the center of which rises the ornamented feather-holder, and the plumes of feathers proceeding from it fall to the right and left. The god is clothed in a tunic reaching to his feet, ornamented with delicately incised Maltese crosses, and finished at the neck by a cape of scales. In his right hand the god holds feathers, and his left lies on the medallion of his cape.

Stela No. 2 represents a seated figure, sitting Turkish fashion on a bench, dressed and adorned like the figure in Stela 1. Upon the forehead is a great ribbed turban.

Stela No. 4 represents a richly dressed person of rank, with a strangely trimmed head-dress, from which rise massive plumes. On the ground, to the right and left of the principal figure, sits a prisoner; the rope by which each is bound can be distinctly seen, and seems to be held in the hand of the standing figure.

Stela No. 8 represents a figure in full front; the dress and head-dress extremely elaborate, but resembling the female form at Copan; a richly ornamented upper garment has a border of sea-shells, and the loin-cloth is a network of cords. His head-dress is an enormous structure of scroll and feather work, very elaborately carved. The warrior holds a lance in his right hand, in his left he holds a shield. Captives are kneeling below, to the right and to the left, with hands bound.

Stela No. 9 is a richly-dressed chieftain, in front view, whose right hand holds a lance, surmounted by a death mask; his left arm, a shield and ornamented pouch. The short tunic has a fringe of sea shells, and over it falls a long scarf, which seems to be ornamented with shells. Above the forehead is a circular head-dress, to which is attached an ornament making an elaborate detail, from which proceeds spreading plumes of feathers. Above this is a mask, and great plumes of feathers proceeding out of it, thus giving to the entire head-dress the form of a cross; the arms and top of which are made of feathers, but the main part is made up by the figure itself.



SERPENT STAIRWAY AT PALENQUE.*

Stela 13 shows a richly-dressed personage, scattering cocoa beans—a symbol of prosperity—with his right hand. His breast-plate made up of precious stones, a medallion upon the breast, the girdle and skirt, are very elaborately wrought. He wears breeches of tiger's skin, a red girdle with a red border of sea shells, and a very handsome face in front, from which suspends a long bow with ends. The helmet is ornamented in front with the head of an animal; in the back, with plumes and feathers. The figure furnishes every evidence of wealth.

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* This cut represents the Serpent Stairway at Palenque, but it shows how important a symbol the serpent was throughout Central America. It was, in fact, designed to impress all who looked upon it, with a sense of fear, and for this reason was carved upon the altars, which were placed before the stelæ, as well as upon the columns, which stood before the temples.

and shows that artistic skill had been bestowed upon the costume.

Among the nations of Mexico and Central America, whose civilization was similar, the priesthood always occupied a high rank in the state, and up to the last its members continued to exercise a powerful influence in both public and private affairs. In Anahuac the priestly office does not seem to have been appropriated exclusively by an hereditary class. All had an equal right to fill them. The ministers of the various temples, or the priests, were fitted for their career by being educated in the colleges to which they were sent in their infancy. The priests of noble birth obtained almost invariably the highest honors. The quarrels between the priests and the warrior classes, brought much harm to the Mexican nation, but the kings assumed the privilege of selecting priests, and placed at the head a priest or a warrior of high rank, as they saw fit.

At Tezcuco and Tlacopan, the superior pontiff was usually selected from among the members of the royal family, but in Mexico the office of high priest, like that of king, was elective. The priest-king, the Mexican god of sacred things, was by right high priest of Huitzilipochtli and the head of the church, and had absolute authority over all priests, of whatever rank. In the City of Mexico and other towns, there were as many complete sets of priests, as there were temples. Each had jurisdiction over a section in which the sanctuary or temple was placed; to each temple was attached a monastery, very much as it was in India. In fact, there was a great resemblance between the two religious nations, which were so far apart.

Divination was an especial study of the priests; some professed to foretell the future by the aid of stars, earth, wind, fire, or water; others, by the flight of birds, the entrails of victims, magic signs and circles. The species of paroquet, with flaming plumage, was worshipped in some districts. In this bird, a god was incarnated, who was said to have descended from the sky, like a meteor.

The ordinary dress of the priests was a full white robe. During the ceremony of sacrifice, he wore a kind of tunic with full sleeves, adorned with tassels and embroidered in various colors, with representations of birds and animals. On his head he wore a mitre of feather-work, ornamented with a very rice crown of gold; his neck, arms, and wrists were laden with costly necklaces and bracelets; upon his feet were golden sandals, bound to his legs with cords of gold and bright-colored thread.

There is a large number of ruined cities on the borders of Yucatan, which are in strong contrast to those described. The buildings in them are very much better preserved, and the architecture seems to be of a different type—more regular and with better proportions, and with very little of the grotesque. The buildings here are of stone, neatly squared and laid up in



STELA I AT COPAN.



STELA N—MALE FIGURE.

workman-like manner. They have the usual rectangular openings, or doorways, with stone lintels, supported by columns. Between the openings are banded columns, which serve as ornaments to the walls. Beyond these are heavy cornices, which project beyond the walls.

Mr. Teobert Maler has described these buildings. There is a building which Mr. Maler calls the "Inscribed Palace," situated at Xcalumkin; it has an arched corridor, similar to that of Palenque, in front of which are square doorways; but the posts, piers and lintels are carved with a very interesting and beautiful series of hieroglyphics. The building is in ruins, the roof of the corridor is thrown down and only one door left in its original form; but there are three piers standing and one lintel, all of them carved with hieroglyphics. While above the doorway and overtopping the whole building, is a very high roof, most elaborately wrought into open-work.

The most unique and beautiful of all the buildings described, is the one called "Dsibiltun"; it is a perfect gem. It might be called, perhaps, a square tower, as its height exceeds all its other dimensions; but it is ornamented from base to top, with the neatest and most artistic decorations seen in the whole region. These ornaments are of the usual pattern, made up of grecques and double grecques and cornices with short columns, but the proportion of one part to another, gives to the building a most artistic appearance. One of the ornaments, representing a hook projecting from a snake's head, is made in the conventional style, and so allies the architecture of this region with Copan and Palenque.

The buildings here bear names in accordance with the locality in which they stand. Mr. Maler has given names to the various buildings, which make known the use which he supposes they served, when they were occupied. One building, he calls the "House Palace"; another, he calls the "Temple Palace"; another, he calls "El Castalo"; another, he calls the "Figure Palace." The building with the serpent ornament, he calls the "Serpent Palace." The majority of these buildings have but a single story, and are rectangular in shape, with the usual high ornamental façade, or comb. One of them has two stories, and resembles the tower at Uxmal. The one called the House Palace is a solid building, which runs around the two sides of a court. The corner at which they meet has no passage-way, but in front of the long, single-story buildings are wide doorways, with four heavy columns with capitals upon them.

A very interesting building is described, which Dr. Maler calls "Dsehkbatun." It is characterized by doorways, which are arch-shaped, after a different style. Ten such buildings are represented and described by engravings in Mr. Maler's report, each of them bearing names of the specific localities in which they stood. Besides these are five other buildings, which are built after a different style; one of them has open-

ings, or doorways, but with no columns, either below the cornice or in the entablature. In place of the banded columns are conventional figures, composed of grecques resembling the Roman key.

This finishes the description of the structures which have been recently visited and described by explorers; the most of them situated in Central America, from Mexico to Honduras, and as far south as Nicaragua.

A general review of the cities, their location, style of art, their age, and the period to which they belong, convinces us that there was greater variety than has been generally recognized. They are wonderful, when considered as the handiwork of a people since lapsed into a condition little above that of savages; for, in some respects, they compare favorably with the works of the ancient Greeks, Romans, Egyptians and Assyrians, but present a style of art and architecture which is peculiar to this continent, and must have originated among an aboriginal people. It was formerly a theory that the great palaces and temples were the work of a mysterious civilized race, who had become extinct, but there is no foundation for this. Bancroft says that traditional history represents Yucatan as constituting the Maya empire, whose rulers—secular and religious—reared magnificent cities, palaces and temples, and flourished in great power down to a little more than a century of the Spaniards' coming, when the empire was more or less broken up by civil wars, and the era of dissension and comparative weakness ensued. Some of the great cities were abandoned and left in ruins, but the edifices in most, and the temples, especially, were occupied by factions of the original empire. In this condition the Spaniards found and conquered the Maya people. They found the immense stone buildings and pyramids of most of the cities still used by the natives for religious services, although not for dwellings, as they had probably never been so used, even by the builders.

All the early voyagers and writers speak of the wonderful stone edifices found by them, in the country, partly abandoned and partly occupied by the natives. Nothing in the ruins themselves give any clue to the date of their construction. The history of the Mayas indicates the building of some cities from the tenth to the twelfth century. The natural advantages of the region would indicate that the country had long been occupied. As we go southward and reach the boundary of Honduras, the condition of the country changes rapidly from flat to undulating hills, increasing in height towards the Pacific, and retaining all the wonderful fertility and density of tropical forest growth, without the pestilential malaria and oppressive heat of the plain below. Here the aboriginal Americans reared the temples and palaces in the various cities, which became religious centers, ruled over by priests and kings alike.

This in a general way is true, and yet it is more in accordance with the facts and traditions to consider the cities as in-

dependent of one another, and so constituting the traditional center and religious home of the various tribes, and that there was no great empire to be found in the land. In this respect the cities resembled those of the far East, though there is no evidence that any such hegemony, as prevailed in Babylonia, existed here, though the various cities which were situated around the beautiful lake, and were ruled over by Montezuma and his relatives, resembled such a combination.

It is owing to the fact that the people were divided into tribes and had no unity, that the Spaniards were able to conquer them, one after the other. In conquered provinces, the habits and customs and established form of government, were usually respected. Many of the estates were of ancient origin, the lands of the nobility were either ancient possessions of the nobles, transmitted by inheritance from son to son, or were rewards of valor granted by the king.

This social organization, in which a few ruled over the many, would account for the existence of so many public buildings, such as palaces and temples, and so few remains of private houses. It will also account for the existence of so many statues or stelæ, so-called. Some have imagined that these represented personal divinities, but a more correct conclusion, is that they represented the kings and queens, who were regarded as almost equal to the divinities, and resembled the Incas in this respect. There were, to be sure, in each city many priests, who were supported at public expense, and who had charge of the religious education of the youth. They, however, contributed to the power of the king, and increased the servitude of the people. The very fact that the education of the youth was in their hands, and under their control, contributed to the servitude of the people. Another element that contributed to the same result, was that the priests were supposed to have control of the powers of nature, and were the representatives of the Nature Divinities. As a result, they directed the very industries and employments of the people; the calendar stone was interpreted by them, and the products of the soil were part under their control; the children were brought to the priests, and their destiny prophesied according to the signs on the calendar stone, the condition of the heavens on their birthday proving the key to the problem.

This belief that the priests had power over the Nature Divinities, led the people to consider them half divine. We can imagine the people going to their toil, from day to day, under the direction of the priest, convinced that the very operations of nature, and the progress of the seasons, were under their control. We can also imagine them as bringing the products of their labor, at just such times as the priests have directed; each article of commerce, whether of metal, of stone, of vegetable growth, of natural growth, or of the elements, corresponding to the symbols which were seen upon the calen-

dar stone, and were brought to market under their direction. The sites of the temples and palaces, and the statues which stood near them increased their servitude.

The art and architecture contributed to the same result, for the figures and forms of the Nature divinities, such as the serpent and the manitou face, were everywhere seen, and filled the minds of the people with strange superstitions. Serpent figures were carved upon the statues and the altars; their forms mingled with the drapery, and their open mouths protruded from the sides. But human faces looking out from serpents' jaws were especially suggestive of the supernatural power, which was mingled with the human power. We look at the graceful feathers, which were sculptured upon the columns and formed the head-dress of the kings and priests, and study their colors and see how true to Nature they are; but when we see the serpent forms winding in and out amid the plumage, and the glaring eye protruding from the sides of the stelæ and the ends of the altars, we are ourselves filled with horror, and do not wonder that the people were filled with superstitious fear when they approached the altars, or looked upon the statues.

There was probably a modification of this system as time went on, for while we find the ancient cities, such as Copan, Palenque, Quirigua and Tikal, full of these strange symbols; in the more modern cities, such as are found at Piedras Negras and Mitla, the architecture is more chaste, beautiful and symmetrical. The symbols have given place to conventional adornments, and the true principles of architecture have become prominent. Still, we cannot say that the progress of architecture ever released the people from their thralldom, for the powerful nations, who are the most advanced in culture, who go by the name of Toltecs, built up their capitals and established flourishing cities, make all the most beautiful products of their skill subject to the superstition which their priests constantly played upon. It could not be expected that the ruder people, such as the Aztecs, who came in their place, would be free from its power.

CHAPTER XXI.

The ruined cities of Peru remain to be described, but before doing so it may be well to study the geographical features of the country.

The mountain region of South America extends from the equator southward for more than 1,000 miles. The Andes have a width of over fifty miles, and consist of three chains, the eastern, the central and the western. The sierra region is between the central and the eastern, and varies from fifty to one hundred miles in width. Some of the mountains rise to a great height. Chimborazo is 21,424 feet high. Mr. Markham says:

The region comprised in the Empire of the Incas was bounded on the east by the Amazonian valley, in the dense forests of which, as well as in the boundless prairies, only wandering tribes of hunters and fishers are to be seen. It is only on the lofty plateau of the Andes, where these extensive valleys, adapted for tillage, and in the temperate valley of the western coast, that we find natives advanced in civilization.

One strong proof of the great antiquity of Peruvian civilization is found in the plants which were brought under cultivation, such as the maize and the potato, and especially in the domestication of such animals as the llama and alpaca. Many centuries must have elapsed before these wild creatures, with the habits of the chamois, could have been converted into the Peruvian sheep.

The vegetation in the Sierras varies. In the deep gorges tropical vegetation abounds; in the valleys, the products of Italy and Spain; in the more elevated plains, the crops of Northern Europe appear. Higher up in the mountains are Alpine pasture lands. The strip between the Andes and the coast is twenty miles wide. In this there are certain cities which are well known to history, and among them some well-known ruins. The central strip is the highest but contains more ruins than any other. Here was the famous city of Cuzco, which was 11,380 feet above the sea. The basin of Lake Titicaca is in the southern part of the Andes. This also contains many ruined cities. The lake itself is eighty miles long, and forty miles wide; the basin is over 300 miles long by 100 miles wide. On the southern side of Lake Titicaca are the ruins which have been called Tiahuanaco. The coast region is divided into six sections, and contains ruins which differ from one another and from those of the Alpine regions. These ancient cities indicate that the population which brought in the new civilization into Peru, came in by way of the sea.

The ruins scattered over Peru give evidence of having been erected at different periods, but the earliest date from remote ages. Mr. Clement C. Markham says that five distinct styles may be traced, each representing a long lapse of time. The

first consists of walls of unhewn stones and fortresses. The next of cyclopean ruins.* It is characterized by enormous blocks, fitted together with marvelous precision; by great stone slabs and stone beams, with rough figures carved on the slabs; by colossal rude statues; by "seats" and stairs cut out of the living rock. The third Peruvian style is much later than the cyclopean, and shows a great advance in civilization. The walls were built with polygonal-shaped stones, but they were much reduced in size and could be easily raised and put in their places. Rows of doorways and recesses occur in the walls with stone lintels. The fourth style is characterized by more regular courses.† The walls have a cornice below the highest course. We find also edifices with horizontal courses, and slightly projecting surfaces like rustication. In these we meet with rectangular doorways, windows and walls. The eastern side of the Temple of Cuzco has such a wall, but here the stones are smooth. The end on which the sun's image is placed is apsidal in shape, and the wall is one of the best specimens of Inca masonry. The most perfect specimen of the later style of architecture is at Ollantaytambo. Here is the niched corridor. The chief use of this was as a fortress commanding the gorge. Another such stronghold was at Pisac, in an almost impregnable position, and made strong by art, the rocks being faced with masonry and crowned with circular towers.

In many of the Inca palaces and temples there was a circle for astronomical purposes. The edifices on Lake Titicaca are of the latest style. The workmanship is unsurpassed, and the world has nothing to show in the way of stone cutting and fitting to equal the skill and accuracy of the Inca structures. The edifices were built around a court upon which the rooms opened, and some of the great halls were 200 paces long by 60 wide, and 35 to 40 feet in height. The roofs were of thatch; some of them were very durable.

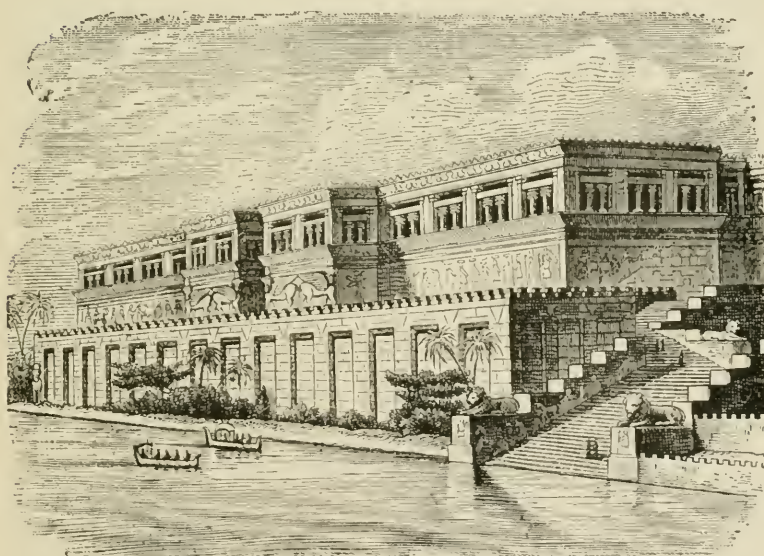
I. The region about Cuzco is better known as the seat of the empire and as the place where the struggle between the Spanish troops under Pizarro and the natives under the Inca took place. We, therefore, take this region first for our description. The chief authority upon Cuzco is the Peruvian writer, Garcilasso de la Vega, who was a descendant himself of the Inca, and who had the greatest admiration for the splendor which so suddenly passed away under his very eyes. He has been charged with exaggerating the truth, but his descriptions

* A cut representing the cyclopean walls may be seen on page 51, and again on pages 288 and 289.

† The two cuts given on the following page are "Reconstructions," after imaginary models. The first one, representing the Palace at Cuzco, is taken from Windsor's "Narrative and Critical History of America." It is after a drawing given in "The Temples of the Andes," by Richard Inwards, London, 1884. The similarity of this "restoration" to that of Babylon will be noticed. Neither of the cuts represent the real architectural style of the two countries, but are used to show the possibilities of art.



PALACE AT CUZCO—RESTORED.



PALACE AT BABYLON—RESTORED.

are more vivid than any that have been written, and perhaps better represent the reality.

The following is a description of Cuzco taken from his writings:

The imperial city (Cuzco) was on a hill called Hunancuzco. Here Manco Capac established himself, and from it he subdued the country for a distance of eight leagues, and established one hundred villages, and selected a spot for building a temple where they might sacrifice to the sun. The Inca claimed to be a child of the sun, and the people believed he was a divine man, who came from the sun. His descendants, in imitation of him, had their heads shorn, leaving only a truss of hair the width of a finger. They were shaven with razors, using knives of flint.* The Incas wore a headdress of feathers of many colors, which was made with a fringe. They twisted the fringe three times around the head. They also bored their ears, and put in the holes ornaments like stoppers, which made the ears hang down a vera in length and half a finger in thickness.

The Incas understood the course of the sun's movements, and knew the time of the solstices. They were also acquainted with the equinoxes. To ascertain these they had a stone, which was very richly carved, erected in front of the Temple of the Sun. It was placed in the center of a large circle, and occupied the whole width of the courtyard, and across the circle a line was drawn, so that as the shadow of the sun fell upon the line they knew the equinox was coming; and when the sun bathed the columns with light, without any shadow, they knew that it was come. They held that the columns were the seats of the sun.

There were grand and wonderful edifices which had great doorways of masonry, some of them made of a single stone, 30 feet long, 15 feet in breadth, and 6 feet in depth. There were also enormous walls of stone, and figures of giants carved in stone. The Inca received the people in his chair, which was made of stone. He built the fortress of Cuzco, and other great edifices. He ordered landmarks to be set up to mark the boundaries of the nations he had conquered. He also made a bridge over the river, and another across the mouth of Lake Titicaca, called the "Bridge of Huacachaco. It was made of osiers, and was on the water like a bridge of boats. Four cables made of wythes held it in place, two above and two below. The boats were made of large bundles of reeds.

The Temple of the Sun was in the imperial city of Cuzco. An altar to the sun was at the east end of the temple. The roof of the temple was lofty, and of wood covered with thatch. All the walls were covered, from roof to floor, with plates of gold, and over the altar was a plate of gold, with a circular face which was made of one piece of gold. Rays of fire seemed to issue from it, just as the sun seems to have. It was so large as to occupy the whole side of the temple.

The principal door looked to the north; all the doors were coated with plates of gold. The cloister of the temple, which surrounded it on four sides, had a cornice on its upper part consisting of gold. Around the cloister were four great walls. A temple was dedicated to the moon, which was the wife of the sun. One wall was covered with plates of silver which represented a woman's face; another wall was dedicated to the planet Venus and the Pleiades, for they looked upon the stars as the handmaidens of the moon. The whole roof was strewn with stars of silver, like the heavens on a starry night. There was a hall dedicated to the lightning; another to the rainbow. Besides the great halls, there were other buildings in the Temple of the Sun.

Some of the sacrifices were consumed in the court of the temple, and others in front of the temple. The principal streets ran from the great square of Cuzco toward the temple. Four streets, one on each side, led to

* This style of wearing the hair was common among the ancient race in Egypt and Syria, and what is more remarkable this race was marked by "a snouty face" and retreating foreheads, and so resemble the ancient Maya race as well as the Peruvian.—See Sayce's "Ancient Races."

the temple. Within the temple there were five fountains, fed by pipes, which were of gold, though some of the pillars were of stone. A garden was in the temple, which contained many herbs and flowers and large trees. There were also in the garden many animals—large and small—birds and quadrupeds, reptiles and turtles, each placed in its natural position. There was also a vast quantity of vases, jars, etc.

The House of the Virgins was situated at some distance from the temple, for the intention of the Inca was that no man should enter the House of the Virgins, and no woman the temple. The virgins were dedicated to the sun, and were obliged to be of the same blood as the Inca. They lived in perpetual solitude, and remained virgins to the end of their lives. Their principal duty was to weave and make garments which the Inca and his wife wore on their persons. The nuns also made small tassels, which were fastened to a band about a cubit long.

Now, that the description by Garcilasso de la Vega was not overdrawn, is shown by the fact that many of the buildings still remain, and have been described by various travelers, but without understanding their significance. The best description has, however, been written by Mr. E. G. Squier, who was an archæologist, and was acquainted with the history of the Incas and understood their architecture. The following is his description of the palace and temples:

The great cathedral of Cuzco rises on the very spot where the Inca, Viracocha, erected a building. All over this narrow tongue of land we find evidences of the Inca's greatness. The walls of the Temple of the Sun, of the Convent of the Vestal Virgins, of the Palaces of the Incas, are still preserved, and justify the extravagant praise bestowed upon the ancient builders. Cuzco is built on acclivities, more or less abrupt, and the ancient architects were obliged to resort to an elaborate system of terracing.

The terraces were faced with walls slightly inclining inwards, of the kind called "cyclopean." The monotony of the front is generally broken up by the counter-sunk niches resembling blind windows. These niches were always a little narrower at the top than at the bottom, as were all the Inca doors and windows, resembling the Egyptian style of architecture. The stones were of different sizes in the different structures, the larger stones at the bottom; each course diminishing in thickness toward the top of the wall. The joints are so close that it is impossible to introduce the thinnest knife blade. The world has nothing to show in stone cutting to surpass the skill and accuracy in the Inca structures of Cuzco.

The exteriors present the appearance of what may be called "rustic work." The buildings were generally placed around a court, from which all the rooms opened. The walls were from 35 to 40 feet high besides the spring of the roof. They were, perhaps, all of a single story, but we know there were edifices and private dwellings of two and three stories, with windows for the purpose of illuminating the interior. In some of the two-story structures, as, for instance, the palace of the Inca on the Island of Titicaca, in the lower rooms, which are the smallest, the roof or ceiling is an arch, formed by overlapping stones. I found no other arch in the stone edifices of Peru, but I found the true arch in the adobes of Pacha Camac.

The Temple of the Sun was probably the principal and most imposing edifice, not only in Cuzco, but in all Peru, if not in all America. It stood in the lower part of the Inca city, on the high bank of the Huatenay, eighty feet above the bed of the stream, and separated from the stream by a series of terraces faced with cut stone, which formed the famous Gardens of the Sun. The cornice of the walls was of gold, as were the inner walls. At the eastern end was a great plate of gold

representing the sun, all of one piece, which spread from one wall to the other. Beneath it, seated in golden chairs, were the bodies of the Inca rulers. Surrounding the court were other structures dedicated to the moon, pleiades, thunder, lightning and rainbows. There was also a large salon for the supreme pontif, and apartments for attendants. All these are described as having been richly decorated. Mr. E. G. Squier says:

The square was dedicated to the most solemn ceremonies of the Inca religion, and within it none dared to enter, except on sacred occasions. The end of the temple which rose above the famous Gardens of the Sun, is still to be seen, but modified by a sort of balcony, which has been erected in later times.

The structure dedicated to the stars was 51 x 26 feet inside the walls, and the ones dedicated to the thunder and lightning and the rainbow were, so far as can be made out, of about the same dimensions. The apartments of the guardians of the temple were on the right hand of the court. These apartments were 33 x 13 feet each, entered by two doorways, and having eight niches in the wall.

The stone reservoir or fountain, carved from a single block, still stands in the center of the square. It is a long octagon, 7 x 4 feet, and 3 feet deep. The hole in the bottom by which it was filled, is still open.

Some of the chroniclers speak of the temple as being surrounded by a high wall. That the inner walls of the temple were of gold, is not incredible. There exist in Cuzco in some of the private museums, portions of the gold plate with which the walls were covered.

The most conspicuous remains next to the Temple of the Cross, are those of the Palace of the Virgins. It seems to have been a long and narrow building. The walls are now 750 feet long, 20 to 25 feet high, and resemble that of the Temple of the Sun, in the size and finish of its stones. This hall was dedicated to the virgins, who were sent there at the age of eight years, and were placed under the charge of the mother teachers.

The Huayna Capac was between the Temple of the Sun and the Hall of the Virgins. This was an immense structure, nearly or quite 800 feet long, built in the style called "rustic work," with numerous entrances. Over the principal door, sculptured in relief, are two serpents. On the other side of the Convent of the Virgins, was a series of structures containing the palaces of Yupanquis, called Puca Marca. This is, perhaps, the finest piece of ancient wall remaining in Cuzco, and one of the best specimens of the kind of work most common in Inca architecture. It is 380 feet long and 18 feet high. One of the most interesting palatial remains, is the palace of the Inca. It is situated on quite high ground, overlooking the Rodadero and the Hanging Gardens. It was about 200 feet long by 150 broad. The palace itself was of stone, faced after the style of the walls of the great temple. Separated from it were the schools built by the Inca Rocca. The great central square of the ancient city was about 850 feet long by 550 feet broad.

The city of Cuzco was noted for its great temple, its religious houses and its palaces, and in this respect resembled the ruined cities of Central America, though it was built upon the mountain height, while they were built upon the plains.

There is one feature about the city which is especially worthy of notice. It contained an acropolis or fortress which resembled those recently discovered in the Umatsintla Valley, in some respects, but differed in this: that it was built upon the bold headland and somewhat remote from the city itself. This has been compared by Mr. E. G. Squier to the Acropolis of

Athens, the Castle of Edinburgh, and the Rock of Gibraltar, and is called the Sacsahuaman. It is a conspicuous object from every part of Cuzco, and rises to the height of 760 feet to the north of the city. On it, the Incas raised their gigantic cyclopean fortress. Just at the point where it becomes so steep as almost to render ascent impossible, is a series of elaborate terraces supported by cyclopean walls, ornamented with niches, and called the "Terrace of the Granaries." It was here that the first Inca, Manco Capac, built his palace, some fragments of which still remain. The terraces were filled with the richest soil, still celebrated for its fertility. The crops gathered here, under the direct cultivation of the Son of the Sun, were regarded as sacred, and were distributed to be sown in the lands dedicated to the Sun throughout the Empire.

The great cyclopean walls are the most massive of monuments of similar character in both the Old and New World.



INCA'S CHAIR AT PUNO.

It was at the gateway of this fortress that the last desperate contest between the Incas and the Spaniards took place. Garcilasso de la Vega says:

This was the grandest and most superb edifice that the Incas raised to demonstrate their majesty and power. Its greatness is incredible to those who have not seen it; and those who have seen it, and studied it with attention, will be led not alone to imagine, but to believe it reared by enchantment, by demons, and not by men, because of the number and size of the stones placed in the three walls, which are rather cliffs than walls, and which it is impossible to believe were cut out of quarries, since the Indians had neither iron nor steel wherewith to extract or chop them. And how they were brought together is a thing equally wonderful, since the Indians had neither carts, nor oxen, nor ropes, wherewith to drag them by main force

Nor were there level roads over which to transport them, but, on the contrary, steep mountains and abrupt declivities, to be overcome by the simple force of men. Many of the stones were brought from ten to fifteen leagues, and especially the stone, or rather the rock, called Saycusca, or the "Tired Stone," because it never reached the structure, and which is known was brought a distance of fifteen leagues, from beyond the river of Yucay, which is a little less in size than the Guadalquivir at Cordova. The stones obtained nearest were from Muyna, five leagues from Cuzco. It passes the power of imagination to conceive how so many and so great stones could be so accurately fitted together, as scarcely to admit the insertion of the point of a knife between them. Many are, indeed, so well fitted that the joint can hardly be discovered. And all this is more wonderful, as they had no squares or levels to place on the stones to ascertain if they would fit together. How often, must they have taken up and put down the stones to ascertain if the joints were perfect. Nor had they cranes or pulleys, or other machinery whatsoever. But what is most marvelous of the edifice, is the incredible size of the stones, and the astonishing labor of bringing them together and placing them.

Mr. E. G. Squier's comments on this description are instructive. He says:

The stones composed in the fortress are limestone. Some were taken from their natural positions nearby; others were wrought from the limestone cliffs, or ledges, three-fourths of a mile distant. Two distinct and well graded roads still remain, leading to these ledges. Blocks, half hewn, still lie in the quarries, and some by the side of the roads. They must have been moved by combined human force on rollers of wood or stone, and forced up inclined planes to the positions they were to occupy. The "Tired Stone" is an enormous mass of 100 tons or more, and was never moved by human power. Its top, like the tops of hundreds of other rocks, is cut into seats and reservoirs; its sides cut into niches and stairways; a maze of incomprehensible sculpture. The largest stone in the fortress has a computed weight of 361 tons.

On the very summit of the rock of Rodadero there is a series of broad seats, rising one above the other in front and at the side, like a stairway, cut with great precision in the hard rock. This is called the "Seat of the Inca."* One part of a low limestone cliff, not far from the Rodadero, is called the *Chingana*, or "Labyrinth." It is much fissured naturally. These fissures have been enlarged by art, and made into low corridors, small apartments, niches and seats, forming a maze in which it requires great care not to become entangled and lost.

This description of the city of Cuzco is confirmed by all the writers. The Temple of the Sun became the Convent of the Friars. The great cathedral rises on the very spot where the Inca, Viracocha, erected a building. The walls of the Convent of the Vestals and the palaces are still preserved, and where these walls have disappeared we find the ancient doorways which the modern builders have preserved, and are thus enabled to trace the outlines of the ancient city. That it had a barbaric wealth of gold and silver and stately structures we can well believe, for this is confirmed by concurrent evidence and existing remains.

The absence of sculpture in Peru, excepting small articles

* These so-called "seats" are very common throughout Peru. The Inca's Chair at Puno is shown in the cut; another one is at Cuzco; another at Copacabana. Seats like these are numerous on the mountains around the City of Mexico, and also at Quemada in the northern part of Mexico.

in stone, is conspicuous and quite in contrast with what we find in Mexico and Central America.

It will be noticed that there is very little columnar architecture in Peru. In this respect there are great contrasts to the ruined cities of Mexico and Central America, for columns there are very prominent, though they are columns without capitals. Another difference may be also noticed. In Central America lattice work is frequently represented in stone on the façades, but in Peru there is no lattice work, but arabesques and raised block work.

One of the most curious architectural structures in Cuzco is the Temple of Viracocha. The dimensions of it were as follows: the ruins consist of a wall of adobe 40 feet high, built on a stone foundation eight feet high. The wall consists of twelve piers, $19\frac{1}{2}$ feet wide, separated by open spaces which form doorways. The roof was supported on twenty-five columns, and the width of the temple was 87 feet. It would seem that the Incas wanted to display their grandeur and power by the majesty of their edifices and the ingenuity of the masters in art, not only in the smooth stones cut in the rough rock, but they also proved their military skill by erecting fortresses.

The next city which is to be described is one situated in the valley of the Yucay, which is one of the most beautiful in Peru. A vast system of terraces lines it on both sides. These terraces rise from the level ground, and cover the sides of the mountains to the height of 1,000 to 1,500 feet; narrowing as they rise. Very often an artificial aqueduct starts from some ravine and is carried along the mountain side to the gardens. Every strip of land is utilized, and every foot of ground is irrigated.

These have been described by various travelers. The principal fortress is reached by a series of mountain paths which go zig-zag up the mountain side. Here is a confused mass of buildings and blocks of stone. A precipice rises more than a thousand feet, but below the view from the fortress in every direction is wonderful in variety, in beauty and in grandeur. Mr. E. G. Squier says:

Within the walls are rock-cut seats; doorways of beautifully hewn stones, with jambs inclining inward, long ranges of niches in cyclopean walls; stairways and terraces, with a shabby and tottering cross at the extremity of all, bending over the village that lies like a map beneath.

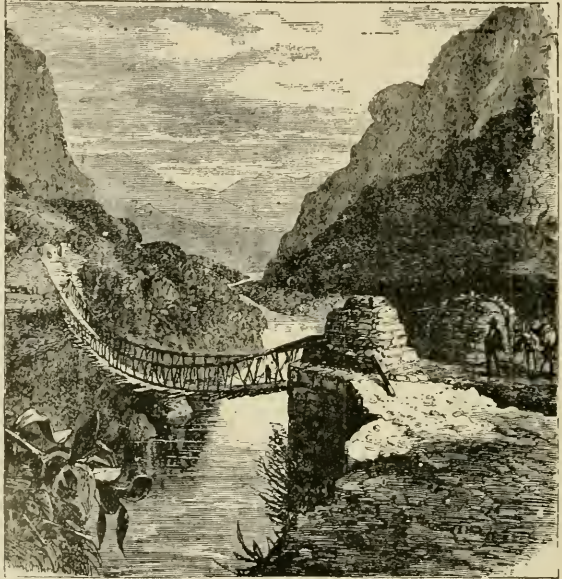
The most interesting series of stones, however, are six great upright slabs of porphyry, supporting a terrace, against which they slightly incline. It will be observed that they stand slightly apart, and that the spaces between them are accurately filled in with other thin stones in sections. The sides of these, as well as the larger slabs which they adjoin, are polished. Gigantic, as are these blocks, they are small in comparison to the "Tired Stones" lying on the inclined plane leading to the fortress. One of these is 21 feet 6 inches long and 15 feet broad.

The whole valley of Ollantaytambo is laid out like a garden, in a system of terraces, one below the other, falling off, step by step, to the river; each terrace level as a billiard table, or with just enough declivity to permit of easy irrigation. The river flows at the very foot of the bare majestic

mountain at its further side, and falling into it at right angles is the chafing, turbulent mountain, snow-fed torrent.

Facing us, most remarkable of all, is the Mountain of Pincullana, or "Hill of Flutes," an abrupt, splintered mass of rocks, thousands of feet high, cutting the sky with its jagged crest. Hanging against its sides, in positions apparently, and in some places really inaccessible, are numerous buildings. In one group is a series of five long edifices, one above another on corresponding terraces, called the "School of the Virgins." On a bold projecting rock, with a vertical descent of upwards of nine hundred feet, stands a small building, with a doorway opening on the very edges of the precipice; it is the Horca del Hombre, the Tarpeian Rock of the Ollantaytambo, over which male criminals were thrown in the severe Draconian days of the Incas. Above it, at a little distance, on a narrow shelf, are the prisons in which the criminals awaited their doom. To the left of these again, separated by a great chasm in the mountains, but at the same giddy height, and overlooking another precipice not less appalling, is the Horca de Mujer, or place of execution for the women.

Nothing can exceed the regularity and taste with which the town was laid out, the streets running parallel to the stream that watered it, which was and is, confined between walls of stone; regular terraces of richest soil, with flights of steps at intervals, rise from the level on which the town stands. Ancient houses, substantially perfect, are still inhabited, and give us an idea of the manner in which the ancients lived. Bridges span



SUSPENSION BRIDGE OVER RIO PAMPAS.

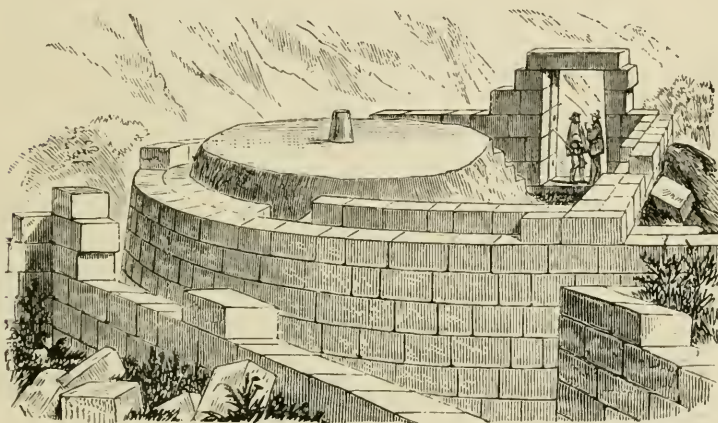
the streams, similar to those which were used in prehistoric times. One such bridge is seen in the cut. It is a suspension bridge made of braided wythes. It consists of several cables of braided wythes placed side by side, and anchored by a variety of clumsy devices to buttresses. These bridges are seldom level, and besides sagging greatly, often get lop-sided.

Ollantaytambo was the frontier town and fortress of the Incas. The site of the palace is not only pointed out, on the terraces overlooking the valley, but the walls remain entire, showing that the Inca architecture was not unlike the modern, as it is a two-story building, with walls and windows and stairways, but was elaborate in its plan. One of the most remarkable features about Peru, is that the ancient cities might be within sight of one another and yet would be inaccessible, as there were deep gorges or snowy ranges, the streams flowing in different directions.

The fortress of Pisac is not far from the city of Yucay. It was one of the most formidable and gigantic fortresses of

Peru, and can be paralleled only by the great "Hill Forts" of India. The ascent to it is by a stairway partly cut in the rock and partly composed of large stones, with projecting bastions on which are towers and magazines of stone ready to be hurled upon an advancing assailant. At intervals are resting places, paved and surrounded by stone seats, but always dominated by some sinister tower. Near the fortress are terraces ascended by flights of steps, with conduits for irrigating and supplying the fortress with water. Every rood of surface that can be, is propped up by terraces and cultivated. There is not a point of the mountain that is not somewhere commanded or protected by a maze of works which involves the skill of an engineer to erect, and baffles description.

The most interesting object found at Pisac, is the enclosure in which is the rock which served as a sun-dial, called "Inti-



SUN DIAL "INTI-HUATANA," NEAR PISAC.

Huatana," the place where the sun is tied up. The entrance to the enclosure is through a doorway, by a flight of stone steps.

Another stone similar to that at Pisac overlooks the fortress in the ancient town of Ollantaytambo; another near Cuzco, within the circular part of the great Temple itself, also on the Sacred island of Titicaca is another, made out of the limestone rock. The sacred character of the edifices surrounding these, is acknowledged. They were devices by which the solstices and equinoxes were marked, and the length of the solar year was determined. Garcilasso de la Vega says there were sixteen of these pillars at Cuzco. It was the duty of the priests to watch the shadows of the columns which were in the center of the circle. When the rays of the sun fell full on the column, and it was bathed in light, the priest declared that the equinox had arrived, and proceeded to place on it flowers and offerings, and the Chair of the Sun.

Acosta says that at Cuzco there are twelve pillars. Every month, one of the pillars denoted the rising and setting of the sun, and by means of them they fixed the feasts and the seasons for sowing and reaping, and for offering sacrifices.

The Circle of the Sun at Sillustani has already been described. This consisted of a pavement in a circle, surrounding an enclosure, in which were two pillars, which were in a line so as to catch the rays of the sun and cast their shadows. This resembles the circle at Stonehenge, and shows that sun worship was attended by the same symbols everywhere. Mr. E. G. Squier says of the gnomon at Inti-Huatana that it is the best preserved of any. He says:

Steps in the rock lead to the summit. It is cut perfectly smooth and level, affording an area 18 feet long by 16 feet broad. In the center of the area, and rising from the living rock of which it is a part, is the gnomon. It is in the form of a cone, sharply cut out and perfectly symmetrical, 11 inches in diameter at its base, 9 inches at its summit, and 16 inches high. I was told by the Governor of Pisac, who accompanied me on my visit, that this column, or gnomon, was formerly surrounded by a flat ring of chumpe, or Peruvian bronze, several inches high, which he had often seen when a boy.*

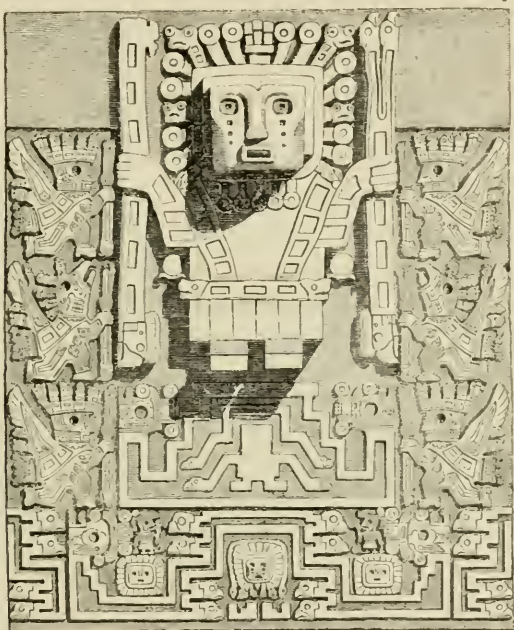
II. Turning from this region, and going south, we come to the lake of Titicaca and the ruins found at Tiahuanaco. This has been called the "Thibet of the New World." Here at an elevation, 12,900 feet above the sea, is the evidence of an early American civilization, regarded as the oldest and most advanced of all on the American continent. The ruins are the most important and the most enigmatical. They consist of rows of erect stones of admirable workmanship; long sections of foundations, with piers and portions of stairways; blocks of stone, with mouldings, cornices and niches, cut with geometrical precision; vast masses of stone partially hewn; great monolithic doorways, bearing symbolic monolithic ornaments in relief, smaller, rectangular, symmetrically shaped stones. Here are several structures; one called the "Fortress," and another called the "Temple," both marked by lines of erect stones; also a smaller edifice of squared stones, with traces of an exterior corridor, which has sometimes been called the "Palace."

The fortress is a great mound of earth, 620 feet long, 450 feet wide, and 50 feet high, the sides of which were terraced. On its summit are sections of foundations of rectangular buildings. On its slopes lie blocks of stone, sculptured with portions of elaborate designs. To the southeast of the fortress is a long line of ruins, one of which is called the "Hall of Justice." It consists of a rectangle 420 feet long, 370 feet broad, defined by a wall of cut stones supporting an interior platform of earth, 130 feet broad, and enclosing a sunken area, defined by a wall of cut stones; the court being about 240 feet

* E. G. Squier, "Peru," page 525.

long, and 160 feet broad. It is a kind of platform, made of well cut blocks of stone, held together by copper clamps. On the eastern side of the platform are three groups of seats, cut in the stone; one group divided into seven compartments. Between the central and side groups were reared monolithic doorways. One of these is unquestionably the one forming the entrance to the cemetery of Tiahuanaco.

This cemetery is an ancient rectangular mound, about 100 paces long, 60 feet broad, and 20 feet high. Its summit is reached by a gateway whose back differs from that of the front. It now stands erect, and is described by every traveler.



GATEWAY OF CEMETERY AT TIAHUANACO.

The following is the description given by Mr. E. G. Squier of the sculpture:

The gateway of the cemetery is the most remarkable monument. This is formed of a block of stone, somewhat broken and defaced on its edges, but originally cut with precision; 13 feet 5 inches long, 7 feet 2 inches high above-ground, and 18 inches thick. Through its center is cut a doorway, 4 feet 6 inches high, and 2 feet 9 inches wide. Above this doorway, and as it now stands on its southeast side or front, are four lines of sculpture in low-relief, like the Egyptian plain sculptures, and a central figure, immediately over the doorway, sculptured in high relief. On the reverse we find the doorway surrounded by friezes or cornices, above it, on each side, two small niches; below which, also on either side, is a single large niche. The stone itself is a dark and exceedingly hard trachyte. The

central and principal figure is boldly cut in a conventional style. The head is surrounded by a series of what may be called rays, each terminating in a circle, the head of a condor, or that of a tiger, all conventionally but forcibly treated. In each hand he grasps two staves, or sceptres, of equal length with his body, the lower end of the right hand sceptre terminating in the head of the condor, and the upper in that of a tiger; while the lower end of the left hand sceptre terminates in the head of the tiger, and the upper is bifurcate and has two heads of the condor. The staves or sceptres are not straight and stiff, but curved as if to represent serpents, and elaborately ornamented as if to represent the sinuous action of the serpent in motion.

The winged human headed or condor-headed figures are represented as kneeling, with their faces turned to the great central figure, as if in adoration. Each one holds before him a staff or sceptre.

The lower row of sculpture differs entirely from the rows above it. It consists of repetitions of the head of the great central figure, surrounded by corresponding rays arranged alternately within zig-zags or grecques, every angle terminating in the head of a condor. Figures also of men crowned with the plumed cap, and holding in their mouths what appear to be trumpets, are seen standing over the faces.

The proximity of the sanctuary and the sunken area and the portico, or shrine, to the monolithic gateway and the mound, or cemetery, is very suggestive, for it would seem as if all the symbols of the primitive nature worship were represented upon the gateway, and were very suggestive to the people who approached the cemetery. The body of the temple is a rectangle, 388 x 445 feet, defined by lines of erect stones, partly shaped by art, fifteen feet apart; a wall, built up between them, supporting a platform of earth, eight feet above the general level. These stones are less in dimensions than the stones composing the circle in Stonehenge, but are much more accurately cut and constitute a straight colonnade. The stones are panelled, the sides and edges are slightly cut away, so as to leave a projection of about an inch and-a-half, designed as if to retain slabs fitted between the stones.

The temple seems to be the most ancient of all the structures of Tiahuanaco. It is the American Stonehenge. The stones defining it are rough and frayed by time. The walls between its rude pilasters were of uncut stones; and although it contains the most elaborate single monument among the ruins, and notwithstanding the erect stones constituting its portal are the most striking of their kind, it nevertheless has palpable signs of age and an air of antiquity which we discover in none of its kindred monuments. Of course its broad area was never roofed over, whatever may have been the case with smaller interior buildings no longer traceable. We must rank it, therefore, with those vast open temples (for of its sacred purpose we can scarcely have a doubt), of which Stonehenge and Avebury, in England, are examples, and which we find in Brittany, in Denmark, in Assyria, and on the steppes of Tartary, as well as in the Mississippi Valley.

The Sacred Islands of Titicaca are worthy of special notice. The Incas traced their origin to this spot. According to tradi-

tion, Manco Capac and his wife started on their errand to instruct the savage tribes in religion and the arts, and reduced them under his government. Here were remains of the Temple of the Sun, a convent of priests, a royal palace, and not far distant is the Island of Coati, on which stands the famous palace of the Virgins of the Sun, built around two shrines dedicated to the Sun and Moon. The sacred rock of Manco Capac is on the island, a rock which sheltered the favored Children of the Sun, and the Pontif Priest and King, who founded the Inca Empire. This rock is a natural formation. It protrudes above the ground, and is about 225 feet long and 25 feet high. Its position is remarkable, and its precipitous sides and dark cavernous recesses were likely to awaken



LAKE TITICACA AND PALACE.

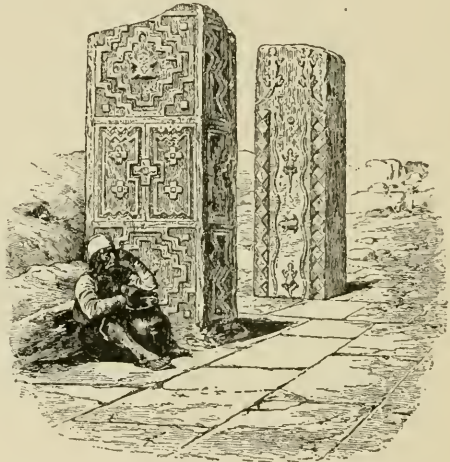
superstition. In front of it, there is an artificial terrace and shrines devoted to the thunder and lightning. From the front of the terrace the island falls off to the lake by a steep declivity. Not far away are several structures which were residences of priests and attendants. Leading up to the shrine is a broad road, hewn in the rock, and about midway are what have been called the "Footprints of the Inca." To the northward of the rock is the Storehouse of the Sun, called the "Labyrinth." A fourth of a mile to the southwest are other ruins.

The "Fountain of the Incas" is here. Amid terraces, supported by walls of cut stone, is a pool 40 feet long, and 10 feet wide, filled by water that comes through subterranean passages. Below this reservoir the water is conducted from terrace to terrace, until it is discharged into the lake. Near-by, is the

"Palace of the Incas," which stands on a beautiful site surrounded by terraces, which extend in graceful curves, making an amphitheatre. The building itself is 51 x 44 feet, two stories high, and fronts on the lake, and is divided into twelve small rooms. Every room had its niches. The walls are stuccoed. The second story has its entrance on a level with the terrace. The front forms a balcony or esplanade, 22 x 10 feet, and has two niches raised enough to afford easy seats; and before it is one of the most extensive views in the world. In the center of the view is the island consecrated to the moon.

At Pimo, within the basin of the lake, is the sandstone rock, which is cut, or carved, into a seat resembling a large arm chair; while below, in front, and around, are other seats, reached by other flights of steps, also cut in the rock. It is said to have been the resting place of the Incas.

The Island of Coati is in front of the palace, six miles from it. There are two groups of ruins on the island. The principal one is called the "Palace of the Virgins of the Sun." It occupies the summit of a series of seven terraces, and is reached by zig-zag paths or curiously designed stairways. The palace is built around three sides of an oblong court, 183 x 80 feet. All the architectural ornaments are on the façades fronting the court, and consist of lofty and elaborate niches. In the center of each is a panel. These break up the monotony of the walls. There is a line of cornices over the entrances. Every door opening on the court led to a separate system of chambers. The view from this palace and the terraces is wonderful.



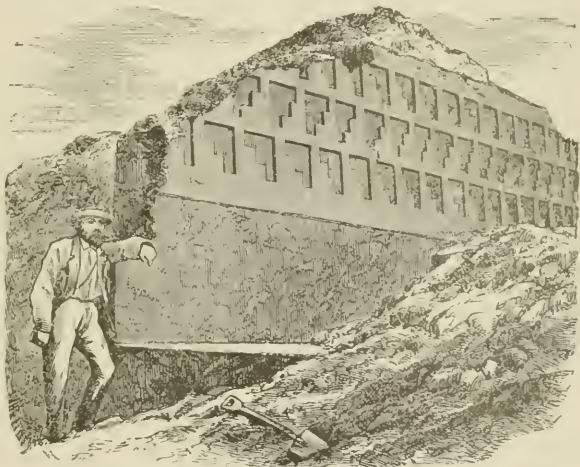
SANDSTONE PILLARS AND PAVEMENT.

Burial towers, hill forts and chulpas are numerous in this locality, also sun circles. The chulpas at Sillustani are the most remarkable of all. Here, is the Sun Circle which has already been described. Two leagues from the lake are the two remarkable sandstone pillars and pavement, represented in the cut. These are carved to represent lizards and frogs and elaborate geometrical ornaments. It is said that they once formed the jambs of an Inca structure which stood on the peninsula of Sillustani. These pillars show the style of ornamentation which was common throughout Peru, and which was

as characteristic of the Peruvian architecture, as the projecting and the Manitou face were of the Maya architecture in Central America.

III. The third district in which the ruined cities of Peru are to be seen, is situated along the sea-coast. Here, for 600 miles north and south, were many valleys in which a race, which was distinct from the Quichuas of the mountains, had settled. What this race was, and whence it came, is not at present known, but the fact that there are so many lofty pyramids in the region, and they resemble the pyramids of Central America, make it reasonable that they were in some way related to the ancient Maya race. Whether this is true or not, the conclusion is forced upon us that the people came by way of the sea, and established themselves near the various harbors which are found at intervals on the sea-coast.

The ruins are most numerous in the vicinity of Lima, along the Chillon River; also at Pachacamac, at Limatambo, at Truxillo, at Chimu, at Moche, and at Huacatambo. It should be said, that in these places the style of erecting the walls and the arrangement of cities are quite different from those practised by the people on the mountains, or the Sierras between them.



ORNAMENTAL WALL NEAR LIMATAMBO.*

The Inca Empire had obtained its greatest extension and power precisely at the period of the Discovery by Columbus. From their great dominating central plateau, the Incas had pressed downward toward the Pacific, on one hand, and to the dense forests of the Amazons, on the other. The empire extended north and south, not far from 3,000 miles, and from east to west, not far from 400 miles, covering a territory equal to the United States east of the Mississippi River. The valleys are often separated from each other, and their inhabitants constitute separate communities, independent in government, and with little intercourse. They resembled in this respect the

* The wall surrounding the Huaca or "Sacred Place" is decorated with the sunken panels resembling the stepped figures of the Zunis and Moquis, but reversed.

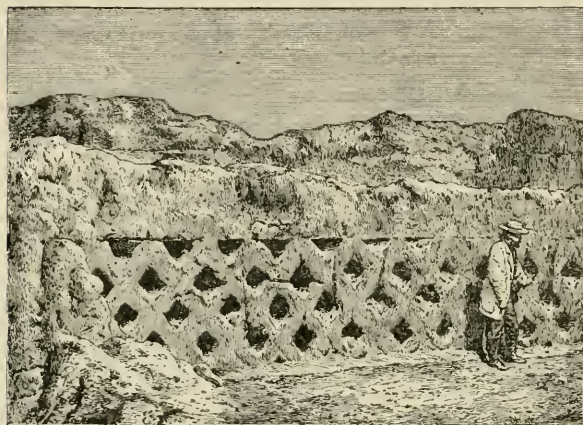
people who were settled in different valleys on the northwest coast. Those who were living in Titicaca resembled the people who settled in the valley of Mexico, and the beginnings of Inca civilization were developed about this lake, as those of the Toltec civilization were near the northern lake.

These cities have all been described by Mr. E. G. Squier. He says:

Pachacamac is one of the most notable spots in Peru, and was the sacred city of the natives of the coast before the conquest by the Incas. Here was the shrine of Pachacamac, their chief divinity, and here also the Incas erected a vast Temple of the Sun, and a House of the Virgins of the Sun. The name, "Pachacamac," signifies "he who animates the universe," the creator of the world. The two principal edifices now traceable, are the temple which supported the shrine of Pachacamac, and that reared by the conquering Indians, called the Convent of the Virgins. The former occupies the head-

land, which rises about 500 feet above the sea. About halfway up the hill commences a series of four vast terraces forming a pyramid, the surface at the top covering several acres. It was covered with ruins.

The building, having the Inca type, is a convent, rather than a temple. A remarkable feature is an arch, perfect and well turned; the length, 14



RUINED WALL NEAR CHIMU.*

feet 9 inches; width, 5 feet 6 inches; height, 8 feet; spring of the arch, 35 inches. A true arch is a thing exceptional.

A single tomb explored by Mr. Squier revealed several mummies wrapped in blankets of finely-spun wool, also cotton cloth, diamond-shaped pattern; a necklace of shells; a spool of thread; knitting tools; toilet articles; a boy's sling, and pottery.

The ruins known as the "Palace of the Inca," are found in the valley of Canete, in the vicinity of Lima. A row of piers give entrance to a square court, enclosed by a wall; many of which are niched. Ruins in the valley of Huarco are remarkable for numerous flights of well-laid steps and a temple, which was scarcely less adorned than that of Pachacamac in richness of gold and silver. Here was an idol called Rimac. The

* Ornament resembling lattice work was formed out of adobe and stucco. The wall surrounded a hall or court, but had a graded way leading to its summit.

double wall that surrounds the temple and other structures of the place, is more than three miles long, and in some places more than sixteen feet high. A portion of the wall has the peculiar sunken panels shown in the cut. There are a number of clusters of ruined buildings within the walls.

The ruins of Cajamarquilla are described by Mr. Squier. There are no windows, and no traces of gables, but the doorways have peculiar shapes; some of them ovals, some triangles, and some circular.

These ruins consist of three groups of buildings around a central mass, with streets between them; pyramidal edifices, rising stage on stage, with terraces and broad flights of steps leading to their summits; also apartments connected by blind and narrow passages, and subterranean vaults connected with peculiar doorways.

The walls of the huaca or pyramid temple near Limatambo show the style of ornamentation which was peculiar to Peru. It is a stepped figure reversed.

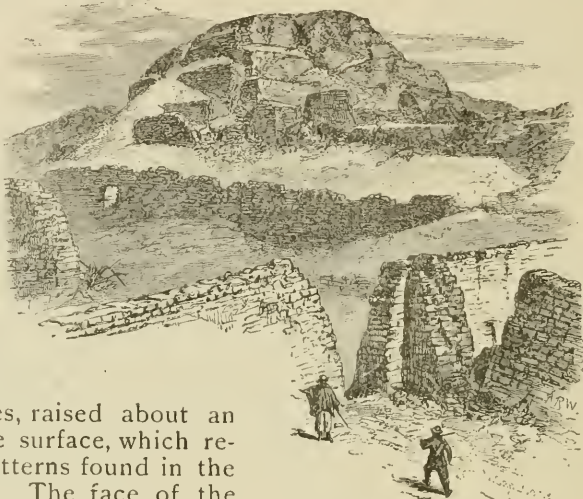
The ruins at Truxillo, on the plain of Chimú, consist of long lines of massive walls, gigantic chambered pyramids, remains of palaces, dwellings, aqueducts, reservoirs, granaries, prisons, furnaces, foundries, and tombs, extending for many miles in every direction. These are the ruins of Grand Chimú, the most extensive and populous of all the cities of ancient Peru. A league or more from the city was the aqueduct, which was carried across the valley on a lofty embankment more than sixty feet high, built of stones and earth, with a channel on top of the dimensions of our ordinary canals. It was designed to supply the ancient city. Below, stretching away over an area twelve to fifteen miles long, and five or six miles broad, was the plain of Chimú, covered with ruins. They consist of a wilderness of walls, a labyrinth of ruined dwellings, gigantic huacas or pyramids, great masses which the visitor finds it difficult to believe are artificial; terraces, cleared of stones, each with its acequia for irrigation, evidently the gardens and pleasure grounds of the ancient inhabitants. Here were two rectangular enclosures, each containing a truncated pyramid. One of the enclosures was 252 x 222 feet, the pyramid 162 feet square and 50 feet high; the other enclosure was 240 x 210 feet, walls 20 feet high, the pyramid 172 feet long, 152 feet wide, 40 feet high.

The pyramid of Obispo is 150 feet high, and covers an area of about eight acres. The summit is reached by zig-zag lines, or stairways. In front of it is an ancient avenue or street, lined on both sides by monuments.

The great pyramid of Moche stands on the edge of the desert slope, just where irrigation begins. A kind of gigantic landmark, the most impressive monument seen in Peru, constructed throughout of large adobes, rectangular in shape, covering a trifle more than seven acres, 200 feet high, the summit of which was reached by a causeway or stairway. This

structure, with that of Obispo, Toledo, etc., in common with the teocallis of Mexico and Central America, may have supported buildings sacred to various divinities. The causeway extends from the base of the pyramid, 1,120 feet to a rocky hill, around which are ruins. Here was a stairway leading up to the level area, which was about 400 feet long, and 350 feet wide, and on it stands a terraced pyramid about 200 feet square.

The ruins of Grand Chimu resemble those already described, for here is a great pyramid, a number of palaces, ruined walls with the front in the shape of lattice work, an acropolis, a palace in which was the Hall of the Arabesques, and several other interesting features. This hall is $52\frac{1}{2}$ feet wide, 100 feet or more in length, and covered with an intricate series of arabesques or stucco ornaments in relief, a succession of reduplicated figures, raised about an inch above the surface, which resemble the patterns found in the textile fabrics. The face of the wall is twelve feet high, and the lattice work is made of adobe.



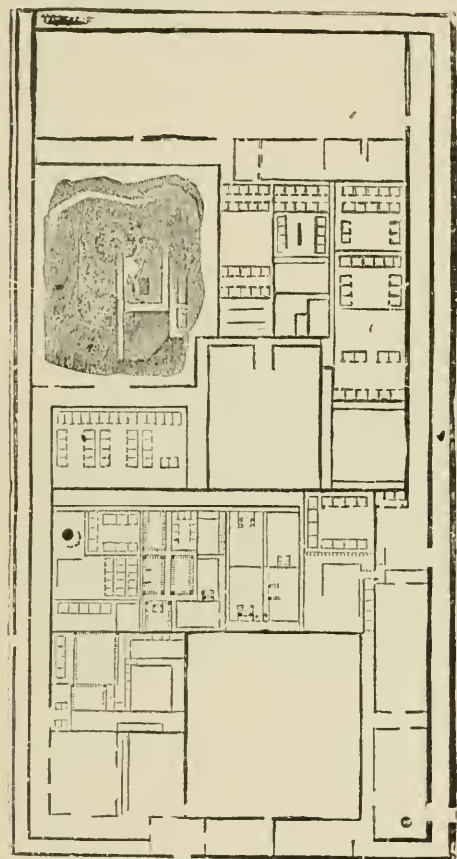
PYRAMID NEAR NEPENA.

The Palace of Chimu is an interesting building, the walls of which are highly ornamented in figures, with lozenge-shaped openings, and others with blocks, or honey-combed. Rivero and Tschudi have described the palaces at this place, and speak about the relics discovered here: mantles of cloth, interwoven with bright feathers; figures of men, and implements of metal of various kinds. The arts, customs, and religion of the Chimus have been described by Garcilasso de la Vega. Objects of gold and silver were found, consisting of vases, gold plates, silver medals, lizards, fishes, serpents, birds, many weapons of bronze, agricultural implements, trowels, knives resembling chopping knives, pottery, vases in the shape of a house supported by a house, musical instruments, trumpets, vases in the shape of human and animal heads, also vases resembling the religious symbols, among which are divinities of the air, earth, and water, and the combat between the man of the earth and the man of the sea.

There are many models of the ancient houses contained in the pottery relics which were gathered here, and from these we may learn the luxuriant habits of the people. Some of these miniature houses are in the shape of pavilions, with columns supporting the roof; others, in the shape of shrines, with the figure of the divinity inside of them; others represent

shrines or temples on the summit of terraced pyramids resembling the teocalli of Mexico; others, in the shape of towers with conical roofs, on the summit of pyramids, around which may be seen the pathway that led to the temple.

The ruins of Huacatambo, in the valley of the Nepena, are, perhaps, the most interesting of any in South America. Here are ancient remains of the "Huaca of the Serpent," so named from a gigantic representation of a serpent cut in the rock, which commences and terminates in a reservoir. Mr. Squier says: "We found the ruins were numerous and interesting. We could discern a number of gigantic huacas standing out boldly on the Atlantic slope, while along the brow of the headland we could trace the line of a great acequia, which conducted the water to



PALACE WITH COURTS AND HUACA,
NEAR TRUXILLO *

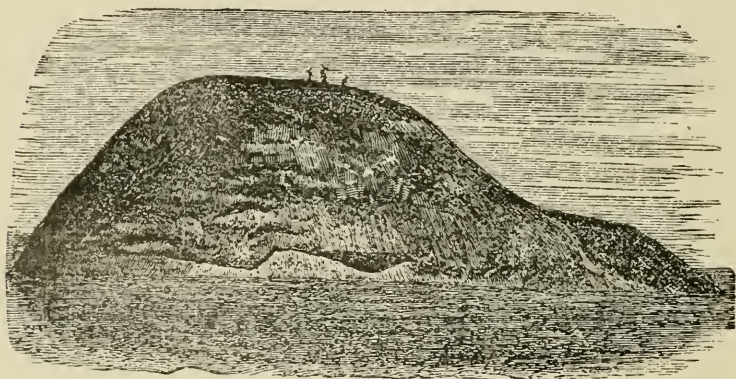
a vast reservoir in the valley among the hills." Mr. Squier also says that most of the pyramids were originally solid, but they were built in terraces, and were probably used for the same purpose as those of Mexico and Central America, as sites for the ancient temples. They were, in fact, fortresses

* This enclosure, with the palace and its three courts and sacred burial pyramid or huaca, covered thirty-two acres. It resembles the buried city of Pompeii, as the ruins of buildings are numerous. Within the pyramid are walled chambers which are full of mummies dressed in royal attire.

as well as temples, for on their summits the kings and priests might be gathered, and the people could stand on each terrace and resist the invaders, to great advantage.

There are pyramids in Peru, which were used altogether for burial purposes, one of which is illustrated in the cut. This was found to contain a vast number of bodies, showing it to be one great burial heap. There are other pyramids which are surrounded by stone walls, showing that they were built by the earlier race, the one that preceded the advent of the Incas.

When Pizarro discovered Peru, he found a great nation enjoying a comparatively high degree of civilization. Constant employment of the people in systematic labor and organized recreation, without oppression or hurry, with no rank of wealth, except that which was held by the rulers; a race too gentle to be ambitious, too docile to be vicious, enabled them to enjoy the most peaceable and prosperous condition ever reached on this



BURIAL MOUND NEAR TRUXILLO.

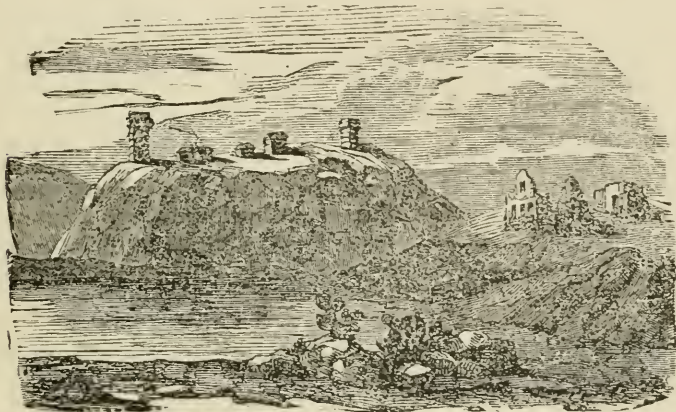
continent. The state of art and architecture was not equal to that which was found by Cortez and his troops in Mexico and Central America, but the abundance of gold and the use of feathers and textile arts, gave the conquerors the impression that they were equal, if not superior to, the Mexicans.

A tradition appears to have come down from the Megalithic Builders which preserves the names of the deity, Pachacamac. This Megalithic empire became disintegrated, and the empire disappeared. But a second empire began with the Incas. This empire resembled that which prevailed in Central America, although the face of the country was in great contrast. There were not so many cities nor were they as near together, for the seats of empire were scattered; the most prominent being at Cuzco, on Lake Titicaca, and those on the coast near Lima.

The cities were without fortifications, but there were fortresses on the mountains near-by, and the temples were regarded as so sacred, as to be secure from invasion. It was

the conception among the people that the kings and ruling classes were in a sense divine, and, as a consequence, the people were ready to sacrifice their lives for their safety. It was only from the invasion of a foreign enemy that danger threatened them; and even then, there was a sense of awe and fear, which prevented the native tribes, though hostile, from attacking the cities.

The burial customs varied among the different tribes, for in the central provinces the bodies were mummified; along the sea-coast they were buried in the huacas or pyramids. A burial mound called the "Sugar Loaf" may be seen at Huaca. It was 66 feet high, 80 yards broad, and 130 yards in length, and is said to be composed of one vast mass of human bodies and bones, the remains of prehistoric people. Another mound, 95 feet high and 428 yards long, was enclosed by a double wall, 816 yards long and 100 yards across, making an enclosure of



BURIAL MOUND AND CHULPAS NEAR LIMA.*

715 acres. These great mounds remind us of the pyramid mounds of the Gulf States, but they were used as burial places, rather than as the sites of the houses of the ruling classes. There was a reason for the use of the pyramidal form for a burial place, as the regard for the hills and mountains would make these great heaps sacred. It was more convenient to deposit bodies in them than it was to excavate burial places in the mountains. Some of the pyramids contained mummied bodies in great numbers, arranged in strata, showing that they had been used as burial places for a long series of years. Occasionally the pyramids were surmounted by chulpas or towers, as may be seen in the cut.

The government reminds us of that which prevailed among the tribes of the Northwest coast, where every village was under

* These burial pyramids contained countless bodies laid in strata, showing that for generations the distant tribes had carried their dead to this place.

the control of a chief, who received his authority from the supernatural divinity, who ruled over the sea, or the forest, and whose authority was symbolized by totem poles. There was this difference that the symbol of authority was the image of the sun, the image of the moon, or heavenly bodies. There were fortifications, as we have said, on the summit of the isolated hills, but the tribes united in veneration for the sun, and each had its own deified ancestor. These were often animals, such as the pimas and condors, which had been converted into tribal deities.

The architecture of the Peruvians was in great contrast to that of Mexico and Central America. There were, to be sure, many temples, and these were the most sacred places in the city; but they were placed upon the common level and never upon a high pyramid. There were also palaces in each city, but the façades of the palaces presented an entirely different appearance from those in Central America. There were no arches, no columns, and no panels, such as are seen in all of the cities of the Mayas. There were no scrolls, or grecques; no figures resembling the Roman key, or Greek fret; no hooked ornament or Manitou face, such as was common in Mexico and Central America.

There is, however, an important lesson to be derived from this, for it proves that architecture was everywhere greatly affected by the religious conceptions and social conditions of the people, the only elements which can be said to be held in common by all people being the mechanical principles which must enter into every building erected by man.

Many different purposes are served by the structures which we have described, purposes which arose in connection with the social, domestic and religious life of the people, but the architectural ornaments came from causes which were hidden deep in the heart and are difficult to analyze or explain.

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